

# The ground of artes

teachyng the worke and practise of Arithmetike, moch necessary for all states of men. After a more easier & exacter sorte, then any lyke hath hytherto ben set forth: with dyuers newe additions, as by the table doth partly appeare.

ROBERT RECORDE.





The bokys uerdict.

To please, or dysplease, sure I am,  
But not of one sorte, to euery man.

To please the beste sorte wold I saye

(ne,

The frowarde to dysplease I am cer

(taine.

The table  
The contentys of the fyrst  
Dialoge.

**T**he declaration of the profyte of  
Arithmetyke.

**N**umeration with an easy and large  
table.

**A**ddition.

**S**ubstraction.

**M**ultiplicatiō,

**D**iuision.

} w diuers exāples,  
and some new four  
mes of woꝝkynge.

**R**eduction with diuers declarations  
of coynes, weyghtes, and measures  
of sondꝝ fourmes, now newly ad-  
ded to these other rules.

**P**rogression both Arithmetticall and  
Geometricall, with certayne que-  
stions touchynge the same.

**T**he golden rule, and the backer rule  
with dyuers questions therto be-  
longynge.

**T**he double rule of propoztion.

**T**he rule of felowshyppe, bothe with  
tyme, and without tyme.

**U**nto all these is added theyꝝ profse.



*The bokys uerdict.*

*To please, or dysplease, sure I am,  
But not of one sorte, to euery man.*

*To please the beste sorte wold I saye  
(ne,*

*The frowarde to dysplease I am cer  
(tayne.*

The table  
The contentys of the fyrst  
Dialoge.

**T**he declaration of the profyte of  
Arithmetyke.

Numeration with an easy and large  
table.

Addition.

Substraction.

Multiplicatiō,

Diuisiō.

} w diuers exāples,  
and some new four  
mes of woꝝkynge.

Reduction with diuers declarations  
of coynes, weyghtes, and measures  
of sondꝝ fourmes, now newly ad-  
ded to these other rules.

Progressiō both Arithmetticall and  
Geometricall, with certayne que-  
stions touchynge the same.

The golden rule, and the backer rule  
with dyuers questions therto be-  
longynge.

The double rule of propozitiō.

The rule of felowshyppe, bothe with  
tyme, and without tyme.

Unto all these is added theyꝝ profes.



The table  
In the seconde  
Dialogue.

**T**he fyrste. v. kyndes of Arithme-  
tike wrought by counters.

**T**he comen kyndes of castynge ac-  
comptes, after marchaūtes fashio,  
and auditours also.

**N**ombrynge by the hande, newly ad-  
ded.

**Finis.**

The preface

**T**O the ryght worthyfull Ma-  
ster Rycharde Whallewe Esquier,  
Robert Recorde wysmeth  
health & prosperous  
successe.



Ove oftetymes have  
I lamented with my  
selfe the infortunate  
conditiō of Englonde,  
seyng so many great  
clarkes to aryse in su-  
dyr other partes of the worlde, and so  
fewe to appeare in this our nation:  
where as for excellencye of naturall  
wytte ( I thynke ) fewe nations do  
matche Englysh men : But I can not  
impute the cause to any other thyng,  
then to the contempte or mysegarde  
of learnyng. For as Englysh men are  
inferior to no men in mother wytte,  
so they passe all men in vayne plea-  
sures, to which they may attayne w-  
out greate payne or labour: & are as  
slacke to any neuer so great comodite  
yf there hange of it any payneful stu-  
dye



The p̄face.

dye : how be it, yet all men are not of that sorte, though the moste parte be, the moze pytie it is : but of them that are so glad not onely w̄ paynfull studye & studyouse payne to attayne learning, but also w̄ as great studye and payne to cōmunicate theyr learninge to other, & make all Englande (yf it mought be) partakers of the same, & most part are such, & vnneth they can suppozte theyr owne necessary chargis so that they are not able to beare any charges in doyng of that good, that els they desyre to do. But a greater cause of lamentatiō is this, that when learned men haue taken paynes to do thynges for the ayde of the vnlearned, scarce they shall be allowed for theyr well doyng, but deryded and scorned and so vtterly dyscouraged to take in hand any lyke enterpryse agayne. So & yf any be found (as there are some) that doth fauour learning & learned wyttes, and can be content to further learning, yea onely with theyr word, suche

### The preface

such men, though they be rare, yet shall they encourage learned men to enterpryse some thynges, at the least, that England may reioyse of. And I haue good hope y England wll (after she hath taken some sure taste of lerning) not only byng forth moze fauourers of it, but also such learned men, y she shall be able to copare w any realme in the world. But in y meane ceason, where so fewe regards of lernynge are, how greatly they are to be esteemed that doth fauour and forther it, my penne wll not suffice to declare. Therfore good M. Whalley, where as I do vpon iust occasyō iudge, yea & know you to be one of them y both loued & also moch desyrezeth to further good lernynge, and yet am not well able to wryte your cōdygne prayse for the same, I thynke it better with silence to ouerpasse it, then other to say to lytle of it, or to prouoke agaynste you the malysce of them, which do nothyngge them selte y is prayse worthy,  
and



The pꛛeface.

and therfoꛛe can not abyde to heare  
the pꛛayse of any other mannes good  
dede, & cōsyderyng your great fauour  
vnto learnyng, though I my selfe be  
not woꛛthy to be reckened in the nom  
ber of greate learned men, yet ain I  
holde to put my selfe in pꛛesse w<sup>th</sup> such  
abplyte as God hath lent me, though  
not with so greate cōynge as many  
men, yet with as greate affection as  
any man to helpe my countre men, &  
wyl not cease dayly (as much as my  
small abplyte wyl suffre me) to endyte  
some suche thyng that shalbe to the  
enstructiō, though not of learned mē,  
yet at the leaste of the bulgare soꛛte:  
whose argument all wayes shal be  
such, that it shal delyte all learned  
wyttes, though they do not learne  
any greate thynges out of it. But to  
speake of this pꛛesent boke of Arith=  
metike, I dare not noꛛ wyl not set it  
foꛛth with any woꛛdes, but remytte it  
to the iudgement of all gentyll rea=  
ders, and namely to you (good M.  
Whalley

The pface.

W<sup>h</sup>alley) besechyng fyrste you so to  
eneme it, as it doth seme worthy. And  
so, other to accept y<sup>e</sup> thyng for it selfe,  
other at the leaste to allowe my good  
endeuoure: but I pceaue I nede not  
vse any perswasjons vnto you, whose  
gentell nature and fauourable mynd  
is redye to receyue thankefully, and  
enterp<sup>r</sup>ete to the beste all suche enter=  
p<sup>r</sup>ises attempted for so good an ende,  
though the thyng do not all wayes  
satisfye mēes expectation. This cō=  
sydered dyd bolden me to appoche  
vnto you with this lyttell boke of the  
arte of numb<sup>r</sup>yng, which yf you shal  
receyue fauorably, you shal enco<sup>r</sup>age  
me to visite you hereafter with some  
greater thyng. And as I iudge you  
of so louyng a mynde to your natyue  
countrye, that you wold moch reioyse  
to se it to p<sup>r</sup>ospere in good learnyng  
and wyttie artes, so I hope well of al  
Englyshe men, that they wyll be not  
vnm<sup>r</sup>yndfull of your dewe prayse, by  
whose meanes they are helped & fur=  
thered

The pface.

thered in any thyng: nother oughte  
they to esteine this thyng of so lytell  
valewe, as many men of lytell dyscre  
tion oftentymes do: for who so setteth  
small pryse by the wyttie deuysle and  
knowledge of numbryng, he lytell  
consydereth it to be the chiefe poynt  
(in maner) wherby men dyffer from  
all brute bestes: for as in all other  
thynges (all most) bestes are parta  
kers with vs, so in numbryng they  
dyffer clene from vs.

The fore in crafty wyt exceedeth most men.  
A dogge in smellyng hath no mā his pere.  
To foresyghte of wether yf you loke then,  
Many bestes excelle man, this is clere.  
Y wittines of elephāt doth letters attayne  
But what cōnyng doth there in the bee re  
mayne?

The emmette forseyng y hardnes of witer.  
Prouideth vitayles in tyme of somner.

The nyghtyngale, the lynet the thrush,  
the larke,

In musical harmony passe many a clarke.  
The hedgehogge of astronomy semeth to  
knowe.

And



The preface.

And stoppeth his caue where the  
wynde wyll blowe. Many thyn-  
ges els of wyttynes of beastes & byr-  
des myght I here saye (saue that an  
other tyme of them I entēde to wryte)  
wherin they excell in maner all men,  
as it is dayly sene: but in nōber was  
there neuer beaste founde so cōnyng,  
þ̄ coulde know oꝝ discerne one thyng  
from many, as by dayly experyence  
you maye well cōsyder, when a bytche  
hath many whelpes, oꝝ a henne many  
chpken, & lyk wapes of other, what  
so euer they be, take frō them all theyꝝ  
pouge, sauynge onely one, & you shall  
perceyue playnly þ̄ they mysse none,  
though they wyll resyste you in ta-  
kyng them away, and wyl seke them  
agayne, yf they maye knowe where  
they be: but els they wyll neuer mysse  
them truely, but take awaye that one  
that is lefte, and then wyll they crye  
and complayne: and restore to them þ̄  
one, then are they pleased agayne, so  
that of nomber this I may iustly say,  
it is

The pface.

it is thonely thyng (all most) that se-  
parateth man from beastes: he ther-  
foze that shall contemne nōber, he de-  
clareth hym selfe as brutyshe as a  
beaste, and vnwozthy to be counted  
in the felowshyp of men. But I truste  
there is no man so fowle ouersene,  
though many ryghte smally do it re-  
garde. Therfoze wpll I now stape to  
wryte agaynst such, & retorne agayne  
to this my boke, whiche I haue wryt-  
ten in þ fourme of a dyaloge, bycause  
I iudge that to be the easiest waye of  
enstructiō, when the scholer may aske  
euery doubte orderly, and þ mayster  
may answer to his questiō playnly.  
How be it, I thynke not the contrary;  
but as it is easyer to blame an other  
mans worke, then to make the lyke,  
so there wpll be some that wpll fynde  
faute, bycause I wryte in a dyaloge:  
but as I coniecture, those shall be  
suche as do not, can not, other wpll  
not perceaue the reason of ryght tea-  
chyng, and therfoze are hūnetye to  
be



### The preface.

be farther answered vnto, for suche  
men with no reason wyl be satisfyed.  
And yf any man obiecte that other  
bookes haue ben wyrtten of Arithme-  
tyke all redy so sufficiently, that I ne-  
eded not now to put penne to the boke,  
except I wyl condempne other men-  
nes wrytynges: to them I aunswere,  
that as I condempne no mans dyl-  
gency, so I knowe that no one man  
can satisfye euery man: and therfore  
lyke as many doth esteeme greatly o-  
ther bookes, so I doubt not, but some  
wyl lyke this my boke aboue any o-  
ther Englyshe Arithmetike hetherto  
wryten, & namely suche as shall lacke  
instructors, for whole sake I haue so  
playnely fet forth the examples, as  
no boke (that I haue sene) hath done  
hetherto, which thyng shall be great  
ease to y rude reader. Therfore good  
M. Whalley, though this booke can  
be vnto your selfe but small ayde, yet  
shall it be some helpe vnto your yong  
chylde, whose fortheraunce you de-  
sire



The preface.

Mye no lesse then your owne. And though to you pꝛyuately I do it dedicate, yet I doubt not (such is your gentelnesse) but that you can be contente that all men vse it, and employ the same to theyꝝ moſte pꝛofyte: which thyng yf I perceaue that they thankfully do, and receaue it with as good wyll as it was wꝛitten, then wyll I shortly with no lesse kyndnes set forth such entroductions into Geometry & Cosinography, as hytherto in Englyshe hath not ben enterpꝛysed, wherewith (I dare saye) all honeste hartes wylbe pleased, and all studyouse wytttes greatly delyted. I wyll saye no moze, but let euery man iudge as he shall se cause. And thus foꝛ this tyme wyll I staye my penne, commyttynge both you & all yours (good M. Whālle) to that true fountayne of perfect nōber, which wrought the hole world by nōber & measur: he is trinite in vnite, & vnite in trinite: to whome be all prayse, honour & glorie, Amen.

**B**efore the introduction  
of Arithmetike these fi-  
gures muste be  
learned.

**F**igures of nomber.

i.	one	xx.	twentye.
ii.	two	xc.	
iii.	thre	xl.	fourthy.
iiii.	foure	l.	fyfthe.
v.	fyue.	lx.	sixtye.
vi.	sixe.	xc.	
vii.	seuen.	c.	nynty.
viii.	eyghte	cc.	a hundred.
ix.	nyne.	ccc.	two hundred.
x.	ten.	xc.	
xi.	aleuen.	d.	fyue hundred.
	xc.	dc.	sixe hundred.
xii.	spuetene.	xc.	
	xc.	m.	thousande.
xiii.	nynetene.		

**Figures of monye.**

**C.** a cee, the. xvi.

**q.** a kewe, the. viii.

**ſ.** a farthing, ſ. iiii.

**ob.** an halfe pennye.

**i. d.** a pennye.

**i. s.** a ſhyllynge.

**i. li.** a pounde.

} part of. i. pēny



**A** dyaloge betwene the Mayster  
and the Scoler: teachynge the  
arte and vse of Arithmetike  
with the penne.

Scoler.



Y<sup>e</sup>, suche is your  
auctorite in myne  
estimatiō, that I  
am content to con-  
sente to your say-  
enge, and to re-  
ceauē it as truth:  
though I se none

other reason, that doth leade me ther-  
vnto: where as els in myne owne cō-  
ceyte it appereth but vayne, to be-  
stowe any tyme priuately in lernynge  
of that thyng, that euery chylde may  
and doth learne at all tymes & hours  
when he doth any thyng hym selfe a-  
lone, & moche more when he talketh  
or reasoneth with other. Mayster.

To, this is the fashyon and chaūce  
of all them, that seke to defende theyr  
blynde ignoraunce. That when they  
thynke

### The commodities

thynke they haue made stronge reason for them selfe, then haue they prouyd the, quyte contrarie. For if numbryng be so comen as thou grauntest it to be, that no man can do any thing alone, & moch lesse talke or bargayne with other, but he shall styll haue to do with numbze: this proueth not numbze to be contemptible & vyle, but rather ryght excellent, and of hygh reputation, syth it is the ground of all mennes affayres, so that without it no tale can be tolde, no communication without it can be longe cōtynued, no bargaynyng without it can duely be endyd, nor no busynes that man hath iustly completed. These comodities, if there were none other, are sufficiēt to approue the worthines of nombze. But there are other vnnumerable farre passyng all these, which declare nombze to excede all prayse. Wherefore in all greate workes, are clarkes so moch desyryd: wherefore are audytours so rychely feepd: What causeth

seth geometrians so hyghly enhaun-  
 cyd: why are astronomers so greatly  
 aduauncyd: bycause that by nombze  
 suche thynges they do fynde, whiche  
 elles shuld farre excelle mans mynde.  
 Sco. Merely sy? if it be so, that these  
 men by nomberynge they? cōnyng do  
 attayne, at whose great woꝝkes most  
 men do wonder, then I se well I was  
 moch deceaued, and nōberyng is a  
 moze connyng thyng than I toke it  
 to be. M. Yf nombze were so vyle  
 a thyng, as thou dyddest esteeme it,  
 then nede it not to be vled so moch in  
 mens cōmūycation. Exclude nom-  
 bze and answer me to this question:  
 Howe many yeares olde arte thou?  
 S. Hum. M. How many dayes in a  
 weke? howe many wekes in a yere?  
 what landes hath thy father? howe  
 many men doth he kepe? howe longe  
 is it syth you came from hym to me?  
 Sco. Hum. M. So that yf nombze  
 wante, you answer all by nūmes:  
 Howe many myle to London? Sco.  
 A.ii. A poke



### The commodities

A poke full of plumbes. Ma. Why thus maye you se what rule nombze beareth, and that yf nombze be lackynge, it maketh men dumme, so that to most questions, they must answer nym. S. This is the cause sy, that I iudged it so vyle/bycause it is so comen in talkynge euery whyle: For plenty is no denty, as the comen sayenge is. M. No, noz store is no soze: perceave you this? The moze comen that a thyng is, beyng needefully requyzed, the better is the thyng, and the moze <sup>so</sup> desyzed. But in nomberyng as some of it is lyght and playne, so the most parte is dyfficulte, and not easye to attayne. The easyer parte serueth all men in comyn, and the other parte requyrez some lernyng. Wherfore as without nomberynge a man can do almost nothyng, so with the helpe of it, you maye attayne to all thyng. S. Yea sy: why then it were beste to learne the arte of nombzyng fyrste of all other lernyng, and then  
a man

a man nede learne no moze, yf all o-  
ther come with it. M. Nay not so, but  
yf it be fyrst learned, then shall a man  
be able (I meane) to lerne, perceauē,  
and attayne to other sciences, which  
without it, he shulde neuer gette. S.  
I perceauē by your former wordes,  
that Astronome and Geometrye de-  
pend moch of y<sup>e</sup> helpe of nombryngē.  
But that other sciences, as musyke,  
physyke, lawe and grammer, & suche  
lyke, haue any helpe of Arythmetike  
I perceauē not. M. I may perceauē  
your great clarkelynes, by the orde-  
ryngē of your sciences, but I wyl let  
that passe nowē, bycause it toucheth  
not the matter that I entende, and I  
wyl shewe you how Arithmetike doth  
profytte in all these, somewhat grossly,  
accozdyngē to your small vnderstan-  
dyngē, omittynge other reasons moze  
substancyall. Fyrste (as you rekened  
them) Musyke hath not only greace  
helpe of Arithmetyke, but is made, &  
hath his perfectnes of it. For all mu-



## The commodities

Arithmetyke  
necessary for  
Physike.

The Lawe.

Grammer.

syke standeth by nombze and propo-  
tion. And in physike, besyde the calcu-  
lation of criticall dayes, with other  
thynges, whiche I omytte. How can  
any man iudge the pulse rightly, that  
is ignoraunt of the propoition of nō-  
bzēs? And as for the lawe, it is playne  
that y man, that is ignozant of Arith-  
metyke, is nother mete to be a iudge,  
nother a proctour. For howe can he  
well vnderstand another mans cause  
apperteynyng to distribution of goo-  
des, or other dettes or sūmes of monie  
yf he be ignoraunt of Arithmetyke?  
This oftentymes causeth right to be  
hyndered, when the iudge other de-  
liteth not to heare of a matter that he  
perceaueth not, other can not iudge  
it, for lacke of vnderstandynge, and  
this cometh by the ignoraūce of arith-  
metike. Now as for grāmer, me thin-  
keth thou sholdest not dowte in what  
it nedeth nōbze, syth thou hast lerned  
that nownes of al sortes, pronownes  
verbes, and participles are distincte  
dyuerfly



dyuerfly by numbers: besydes the variety of nounes of nombze, & aduerbes. And if you take awaye nombze from grammer, then is all the quantite of syllables losse. And many other wayes dothe number helpe gramer. Wherby were all kyndes of meter found and made? Was it not by number? But how nedefull arithmetike is to all partes of philosophie philosophi. they maye sone se, that readeth other Aristotle, Plato, or any other philosophers wytyng. For all they? examples (all most) and they? probations depende of Arithmetike. It is the sayenge of Aristotle, that he that is ignozant of Arithmetyke, is mete for no science. And Plato his mayster wrote a lyke sentence ouer his scolehouse dooze: Let none enter in hyther (q he) that is ignozant of geometrie, Seyng he wolde haue all his scolers experte in geometrie, moch rather he wolde the same in Arithmetike, without whiche, geometrie can not stand.

A.iiit.

And

### The commodities

And how nedefull Arithmetike is to diuynitie, it appereth, seyng so many doctozs gather yng so great mysterys out of nombze, and so moche to wryte of it. And if I shuld go about to wryte all the comodities of Arithmetike in cyuill actes, as in gouernaunce of cōmyn weales in tyme of peace: and in dewe prouision and order of armes in tyme of warre. For nombrynge of thoste: sūmyng of theyr wages: prouisions of vitayles: bewyng of artillarie, with other armour. Besyde the connyngest poynte of all: for castyng of ground: for encāpyng of men, with other lyke. And howe many wayes also Arithmetike is conducyble for al priuate weales, of lordes and all possessioners, of marchauntes and all other occupiers: and generally, for all estates of men besides auditours, treasourers, receyuers, stewardes, baylyffes, & such lyke, whose offices without Arithmetike is nothyng: yf I shulde (I saye) particularly repete  
all

all such comodities of this noble science of Arithmetike, it were ynough to make a very greate booke. S. No, no, sy<sup>r</sup>, you shal not nede: for I dowte not, for this that you haue sayd, were ynough to perswade any manne, to thynke this arte to be right excellent and good and so necessarie for man, that (as I thynke nowe) so moche as a man lacketh of it, so moche he lacketh of his sense & wytte. M. What, are you so farre chaunged syns, by hearynge the fewe comodites in generall: by lykelyhode you wolde be farre chaunged, yf you knewe all the comodities particular. S. I beseeche you sy<sup>r</sup> reserue those commodities, that reste yet behynde, vnto they<sup>r</sup> place moze couenient. And if you wyl be so good, as to vtter at this tyme this excellent treasure, so that I may be somewhat enryched therby, and yf euer I shall be able, I wyl requyte your payne. M. I am very glad of your requeste, and I wyl do it spe-

A.v. Dely

*bnf*



The commodities

dely, sith that to learne it, you be so  
reddye. S. And I to your auctozitie,  
my wyttes do subdewe: what so euer  
you say, I take it for trewe. M. That  
is to moch, and mete for no man, to be  
beleued in al thynges, without shew-  
ynge of reason. Though I myght of  
my Scoler some credence requyre, yet  
except I shewe reason, I do not it de-  
syre. But now sith you are so earnest-  
ly sette this arte to attayne, best it is  
to omitte no tyme, lest some other pas-  
syon coole this great heate, and then  
you leue of before you se the ende. S.  
Though many there be so vnconstat  
of mynde, that flytter and turne with  
euery wynde, which often begyn and  
neuer come to the ende, I am none of  
theyr sorte, as I truste you partely  
knowe. For by my good wpll what I  
ones begin, tyll I haue it fully ended  
I neuer blynne. M. So haue I found  
you hetherto in dede, and I trust you  
wpll encrease rather then go backe,  
for better it were neuer to assay, then  
to

to shrink & flee in the myddell waye,  
but (I truste) you wyll not so do/ther  
foze tell me bzeefely, what call you the  
science, that you desyre so greatly. S.  
Why syz, you knowe. M. That ma-  
keth no matter, I wolde heare, whe-  
ther you knowe/ and therfoze I aske  
you. For greate rebuke it were, a sci-  
ence to haue studied, and yet can not  
tell how it is named.

**C** S. Some call it Arismetrike, and *Arithmetyke*.  
some Alwgryme. M. And what dothe  
those names betoken? S. That (yf it  
please you) of you wolde I learne.

M. Bothe names are corruptly wri-  
ten, Arismetrike for Arithmetyke (as *Ἀριθμητική*  
the Grekes call it) and Alwgrym for *κλ.*  
Algorisme (as Arabians sounde it)  
whiche bothe betoken the science of  
nombrynge. For arithmos in greke, *Ἀριθμός*  
is called number, & of it cometh arith-  
metike, the arte of nomberynge. So  
that arithmetike is a science or arte,  
teachyng the maner and vse of nom-  
brynge, & maye be wrought dyuersly,  
with



## The commodities

with penne or counters, & other wayes  
But I wyl fyyst shewe the workynge  
with the penne, and then thother in  
order. Sco. This I wyl remembre.  
But how many thinges are to be lear-  
ned, to attayne this arte fully? M.  
There are rekened comenly. vii.  
**N**umeration, Addition, Subtra-  
ction, Multiplication, Diuision, Pro-  
gression, and Extraction of radicals:  
to these, some men adde Duplacyon,  
Triplacyon, and Mediatio. But as  
for these last thre, they are conteyned  
vnder the other. vii. For Duplacion  
and Triplacion, are conteyned vnder  
Multiplication, as it shall appere in  
theyr place. And Mediatio is con-  
teyned vnder Deuision, as I wyl de-  
clare in his place also. S. Yet then  
there remaine the fyyste. vii. kyndes  
of nombrynge. M. So there dothe:  
Howbeit yf I shall speake exactely of  
partes of nombrynge, I muste make  
but. v. of them: For Progression is a  
compounde operation of Addytion,  
Mulpy



of Arythmetyke.

7

Multiplication, and Dyuision. And  
so is the Extraction of Radicals.

But it is no harme to name them as  
kynndes seuerall, seynge they appere  
to haue some seuerall workynge. For  
it forsethe not so moche to contende  
the number of them, as for the dewe  
knowlege and practisynge of them.

Sco. Then you wyl that I shall  
name them as. vii. kynndes distincte.  
But nowe I desyre you to enstructe  
me in the vse of eche of them. Ma.

So wyl I, but it muste be done in  
order: for you may not learne the last  
as soone as the fyrste, but you muste  
learne them in that order as I dyd  
reherke them, yf you wyl learne them  
spedely and well. S. Euen as you  
please. Then to begyn, Numeration  
is the fyrste in order, what shall I do  
with it. M. Fyrste you muste knowe  
what the thinge is, and then after  
learne the vse of the same.

Nume=

## Numeratyon.



6 Cyphar.

Numeratio is the arte to expresse and rede all sommes proposed, and is of two sortes, for other it gethereth the valewe of a somme proposed, other els it expresseth a sum conceaued by fygures & places dewe. S. Why? then me thynketh you put a dyfference betwene the valewe and the fygures. M. Yea, so do I. For the valewe is one thyng, and the figures are an other thyng, and that cometh partly by the dyuersite of fygures, but chesely of the places, wherby they be sette. S. Then I must knowe here iii. thynges, The valewe, the fygure and the place. M. Euen so: but yet adde order to them, as the fourthe. And fyrst marke that there are but .x. figures, that are vsed in arithmetike, and of those .x. one doth sygnifie nothyng, which is made lyke an o, and is called priuately a cyphar, though all the other somtyme be lykewyse named

named. The other, ix. are called *fyg- Figures.*  
nifienge *fygures*, & be thus figured:

1 2 3 4 5 6 7 8 9

And this is theyr valewe.

i. ii. iii. iiii. v. vi. vii. viii. ix.

¶ But here muste you marke, that  
euery *fygure* hath. ii. valewes. One  
allwayes certayne, that it *fygnifieth*  
properly, which it hath of his forme.  
And the other vncertayne, whiche he  
taketh of his place.

¶ A place is called the seat or roume <sup>a place.</sup>  
that a *fygure* standeth in. And loke  
howe many *fygures* are wrytten in  
one summe, so many places hath that  
hole valewe. And the fyrst place must  
be called *h*, that is nexte to the righte  
hande, and so reckenyng by order to-  
warde the lefte hande, so *h*, that place  
is *l*ast, that is nexte to the left hand. *Exst*  
As for example, yf there stode before  
you syxe men in a rowe, syde by syde/  
& you shulde tell them as they stande  
in order, begynnynge with the man  
that were nexte to your ryght hande,  
than



### Numeraryon.

than he that were nexte hym, shuld be called the seconde, and so forth to the farthest frō your ryght hande, which is the. vi. & the laste. S. Sy? I perceauē you well, so myght I reckon letters oz any other thyngē. As yf I sholde wyte. viii. letters after this order, a, b, c, d, e, f, g, h, nowe muste I saye, h. is the fyfste, g. the. ii. f. the. iii. e. the. iiii. d. the. v. c. the. vi. b. & vii. and a. the. viii. M. That is well done. And after þe same sorte vse here after, so that what I declare by one example, do you expresse by an other, and so shall I perceauē whether you vnderstand it oz no. And so passe ouer nothyngē tyll you perceauē it well, & be experte therin. S. Sy?, I praye you, howe many of these places be there in all. M. Therē is no certayne nūber of them, but they are somtymes moze, and somtymes fewer, according to the summe that is expresse. For so many as the figures are, so many are the places, and the last place is so cal-

led

# Numeration.

9

led, not bycause it is the laste of all  
other, but is the laste of that present  
summe / and it maye be the myddell  
place in an other summe. S. We se=  
meth I perceauē this very well, as  
towchynge thorder of reckenyng of  
the places. But as for the number of  
them, you say there is no certayntie.  
Now there resteth to declare the va=  
lewe of the fygures, by dyuersitie of  
places, which you called the valewe  
vncertayn. M. But fyrst let me heare  
whether you knowe perfectly the cer=  
tayne valewe. S. Yes syr, as you  
wrote them, so I marked them. M.  
How write you then. v? S. By this  
fygure 5. M. And how. vi? S. Thus  
6. M. Write these. iiii. numbers eche  
by it selfe, as I speake them. vii. iiii.  
iii. S. 7. 4. 3. M. How write you these  
foure other. ii. i. ix. viii? S. Thus (I  
trowe) 2. 1. 6. 8. M. Nay, there you  
myste: Loke on myne exāple agayne.  
S. Syr trouth it is; I was to blame,  
I toke 6 for 9, but I wyll be warer

Valewe vncertayn.

B

here

### Numeration.

here after. M. Now then take hede,  
these certayne valewes euery fygure  
representeth, when it is alone witten  
without other figures ioyned to hym  
And also when it is in the fyrst place,  
though many other do folowe, as for  
example, This figure 9 is. ix. stan-  
dyngc now alone. S. How is he alone  
and standeth in the myddell of so ma-  
ny letters? M. The letters are none  
of his felowes. And yf you were in  
Fraunce in the myddle of M. Frenshe  
men, yf there were no Englyshe man  
with you, you wold reckon your selfe  
to be alone. S. So it is. Then 9 with-  
out moze figures of Awgryn, beto-  
keneth. ix. what so euer other letters  
be about it. M. Euy n so, and so doth  
it, yf it be in the fyrst place ioyned w  
other, how many so euer do folowe,  
as in this example 3679, you se 9 in  
the fyrste place, and doth betoken. ix.  
as yf he were alone. S. I perceyue y.  
And doth not 7 stande in the second  
place, and betoken. vii; and 6 in the  
thyrde



thyrde place, and betoken. vi. And so  
 3 in the fourth place, & betokyn. iiii.  
 M. Theyr places be as you haue said  
 but theyr valewes are not so. For as  
 in the fyrste place, every fygure beto-  
 keneth his owne valewe certayne  
 only. So in the second place every fi-  
 gure betokeneth his owne valewe  
 certayne. x. tymes: as in that exam-  
 ple, 7 in the seconde place, is. vii. ty-  
 mes. x. that is. lxx. And in the thyrde  
 place, every figure betokeneth his  
 owne valewe a hundreth tymes, so 6  
 in that place, betokeneth. vi. hun-  
 dred. And in the. iiii. place, every fi-  
 gure betokeneth his owne valewe, a  
 M. tymes as in the foresayd nōber: 3  
 in the. iiii. place standeth for. iii. M.  
 And in the. v. place, every figure stan-  
 deth for his owne valewe. x. M. ty-  
 mes. And in the. vi. place a C. M. ty-  
 mes. And in the. vii. place, a M. M.  
 tymes. And in the. viii. place. x. M.  
 M. tymes: so that every place excea-  
 deth the former. x. tymes. S. As thus

## Numeration.

yf I make this nombꝛe at all aduentures, 91359684 here are. viii. places, In þe fyrst place is 4, and betokeneth but. iiii. In the second place is 8, and betokeneth. x. tymes. viii. þe is. lxxx. In the thyrde place is 6, and betokeneth. vi. C. In the fourth place 9, is. ix. M. And 5 in the. v. place, is. x. M. tymes 5, that is. l. M. So 3 in the. vi. place, is a C. M. tymes 3, þe is CCC. M. Then 1 in the. vii. place a M. M. And 9 in the. viii. place. x. M. M. tymes 9, that is. xc. M. M. But now I can not easely, nor quykely rede it in order. M. That shall you practyse by this meanes. fyrste put a prycke ouer the fourth figure, and so ouer the. vii. And yf you had so many, ouer the. x. xiii. xvi. and so forth, styll leuyn. ii. figures betwene eche. ii. pryckes. And those roumes betwene the pryckes, are called, ternaries. Then begyn at the last pryck, & se howe many figures are betwene hym, & the ende, whiche can not passe

Trenchard,  
 or Trinitie.

iii.



iii. rekenynge hym selfe for one, then  
pronounce them as yf they were wryt-  
ten alone from the reste, and adde at  
the ende of theyr valewe, so many ty-  
mes thousande, as your nombze hath  
pyckes. Then come to the nexte. iii.  
figures, and sounde them as yf they  
were aparte from the reste, and adde  
to theyr valewe so many tymes thou-  
sand, as there are pyckes betwene  
them and the fyrst place of your hole  
nombze. And so do by euery other. iii.  
figures folowynge, yf you haue mo,  
as in exāple 91359684. this was your  
nombze: put a pycke ouer 9 in the  
iiii. place, & ouer 1 in the. vii. place, &  
then no moze (for your places come  
not to tenne) as thus 91359684. Now  
go to the last pycke ouer 1, and take  
it, and the figure 9 that foloweth it,  
and valewe them alone. S. 91 that is  
xci. M. So is it, but then adde for the  
number of your pyckes, twyse M.  
S. That is. xci. thousand thousand.  
M. So is it. Now take the. iii. other  
B. iii. figu-



### Numeration.

figures from 1 to 9 next prick, & valewe them. S. 359 that is. CCC. lix. M. Now adde for the one prick, that is betwene them & the fyrst place. M. S. CCC. lix. thousand. M. Now come to the other. iii. figures that remayn. S. 684, that is. vi. C. lxxiiii. M. Now haue you valewed all. And at 9 ende of this laste number, you shall adde nothyng, bycause there remayneth no prycke nor number after it : yet proue in an other number, as thus,

230864089105340.

Scoler. 230864089105340. I haue prycked them, as you taught me / but I am in doubt whether I haue done well or no, bycause of the cyphars: for I remembre, you tolde me that they do signifie nothyng, and therfore I doubt whether I shuld reckon them for a figure, in setting of the prickes, and agayne I knowe not wherfore they serue. M, That wyl I tell you now : in dede they are of no valewe them selfe, but they serue to make bp  
number

number of places, and so maketh the figure folowynge them to be in a farther place, and therfore to signifie the more valewe, as in this example, 90 the cyphar is of no valewe, but yet he occupieth the fyrst place, and causeth 9 to be in the seconde place, and so to signifye. x. tymes 9, that is .xc. so p̄ ii. cyphars thrusteth the fygure folowynge them, in to the. iii. place, & so forth. S. Then I perceave in the example aboue, I haue prycked well ynough, for though that cyphar, that is prycked, signifie nothyng, yet must he haue the prycke, bycause he came in the. xiii. place. Then wyl I proue to nombze that summe. Fyrst there is 230. M. M. M. M. 864 M. M. M. And what shall I now do: there is a chyphar in p̄. iii. place, and no figure after hym, but they that I haue reckened. M. He dyd serue for them, that you haue all redy reckened, to make the in a place farther, then they shuld be, yf he were awaye, & therfore now we

B.iii. you



# Numeration.

you shall lette hym go. And so do al-  
wayes when he occupyeth the place  
nexte before any prycke, which is the  
laste of that ternarie: and a cyphar in  
the last place doth nothyng. S. Then  
I shall say but 89 M. M. M. No, but  
go forth. S. 105 M. Now are all my  
pryckes spent, and yet remayne 340,  
so I must valewe them. CCC. xl. on-  
ly. M. Now can you reckon after this  
sorte. And remembre, that euery suche  
roume so parted, is called a ternarie,  
or trinite. Some do parte such great  
nombres with letters, after this maner  
230864089105340. In whiche  
exāple ye may se that a, supplyeth the  
roume of your prycke. And some doth  
parte the nombres with lynes after  
this fourme, 230|864|089|105 340.  
where you se as many lynes, as you  
made pryckes, and to one entent, saue  
that þ lynes doth moze playnly parte  
euery.iii. figures, accor dyng as they  
shulde be valwed vnder one denomi-  
nation. S. Yea sy, but yf you shalde  
shewe



Shewe me a nōber so parted, I shulde take it for many nōbres, and not for one. M. So might you do, not knowynge my meanyng. But what yf I dyd set forth the number without lynnes, and your selfe (for the ease of rekenynge) dyd so parte it with lynnes, wold you forgette wherfore you dyd it, and then take them for many nōbres? S. No, I trowe not, but yet I doubt. M. Then vse that, that you lyke beste, for all the thre wayes is to one entent, saue (as I sayde) that the lynnes doth moze playnly distincte the denominatiōs. S. What call you denominations? M. It is the laste bawlewe or name added to any summe. As when I say. CC. xii. poundes: poundes is the denominatiō: & lyke wayes in sayenge 25 men, men, is the denomination, and so of other. But in this places, that I spake of before, y laste number of euery ternary, is the denomination of it. As of the fyrst ternary the denomination is vnities, and of

Denominations.  
yon.

B. v.

the

## Numeration.

the seconde ternary, the denominatiō  
is thousandes: & of the thyrde ternary  
thousand thousandes, or myllions:  
of the.iiii. thousand thousand thousā  
des: or thousand myllions, & so forth.  
S. And what shall I call the valewe  
of the.iii. figures that maye be pro-  
nounced befoze the denominatozs: as  
in sayeng 203000000 that is CC.iii.  
myllions, I peceue (by your wordes)  
that myllions is the denomination,  
but what shal I call the. CC. iii. ioy-  
ned befoze the myllions: M. That is  
called the numeratour or valewer, &  
the hole summe that resulteth of the  
bothe, is called the summe, valewe, or  
number. S. Now, is there any thyng  
els to be lerned in Numeratiō: or els  
haue I lerned it fully: M. I mought  
here shewe you; who were the fyrste  
inuentours of this arte, and the rea-  
sons of all these thinges that I haue  
taught you, as why you shuld reckē  
your order of places backward, I  
meane from the ryght syde towardes  
the

Numeratour.

Summe

the lefte, with many other thynges,  
 touchynge the causes and reasons of  
 it, but that wyl I reſerue tyll ye haue  
 lerned ouer all þe practiſe of this arte,  
 leaſt I ſhuld trouble your witte with  
 ouer many thynges at the fyrſt. But  
 yet this muſt you marke, þe there are  
 iiii. kyndes of nomber, one called dy-  
 gettes, an other articles, and þe thyrde  
 myrte numbre. A dyget is any nūber  
 vnder 10, as this 1. 2. 3. 4. 5. 6. 7. 8. 9.  
 And 10 with all other that may be de-  
 uided in to .x. partes iuſte (æ nothing  
 remayne) are called articles, ſuch are  
 10. 20. 30. 40. 50. &c. 100. 200. &c. 1000.  
 &c. And that number is called myrte  
 that conteyneth articles, oꝛ at þe leaſt  
 one article, and a digette, as 12. 16. 19  
 21. 38. 107. 1005. and ſo forth. And foꝛ  
 the moze eaſe of vnderſtandyng and  
 remembraunce, marke this: The di-  
 gette number is neuer wꝛitten with  
 moze then one figure, but the article  
 and the myrte number are euer wꝛit-  
 ten with moze then one figure: æ thus  
 they

Thre kyndes  
 of nomber.

Digets.

Article.

Myrte.



### Numeration.

they differ, that the article hath euer-  
more this ciphar o, in his fyrst place,  
and the myrte nūber, hath euer there  
some diget. S. By this laste wordes,  
I perceaue it moch better then I dyd  
befoze, & now ( I thynke ) I wyll ne-  
uer mysse to know those.iii. a sonder.  
M. Yf you remember now all that I  
haue saide, you haue learned sufficy-  
ently this fyrst kynde of Arithmetike  
called Numeration. Howbeit I wyll  
yet exhorte you now, to remeber both  
this, that I haue said, and all that I  
shall saye, & to exercyse your selfe in  
practise of it : for rules without pra-  
ctise, is but a lyght knowledge, and  
practise it is, that maketh men pfecte  
and prompte in all thynges. And as  
you haue learned to gether the va-  
lewe of a summe proposed, so must you  
practise to expresse any summe w<sup>th</sup> theyr  
dewe figures: as for a p<sup>ro</sup>se: How ex-  
presse you this summe, fyue thousand  
two hundzed, fyfty & seuen? S. This  
troubleth me now, whether I shulde  
begyn

begyn at the fyrst figure, or at þ last/  
For reason (me thynketh) shuld cause  
me to begynne at the fyrst, and yet yf  
I writte it as you spake it, I must be  
gyn at the last. M. When you knowe  
your places pfectly, you maye begyn  
where you lyst: but the more ease for  
your hand, is to begyn with the last,  
that is to saye, as I dyd speke them.  
But for the more suretie: a whyle you  
may begyn with the fyrst, repetyng  
my wordes backward, thus: **S**euen  
fyfty, two hundred, fyue thousande,  
Or els sowndyng them al by theyr di  
get or balower, as thus: **S**euen, fyue,  
two, fyue, for that waye is easyst. But  
then must ye loke well, whether there  
be any cyphar in your summe, that he  
may be set in his place, as yf your last  
balower of your summe (as you speke  
it) be aboue 9, then is there a cyphar  
in the fyrst place. And yf it be a hun  
dred or aboue, the is there. ii. ciphars,  
one in the fyrst place, and an other in  
the second, and so forth. But bycause  
this



## Numeration.

this thyng is such that can not be set forth wout many wordes, I thynke beste here now at the ende of Nume= ration, to adde a table easy and reddey for the fyyste exercise of it. And this is that table.

[illegible]



**T**his table (as yow maye se) hath  
aleuen places, & in eche of them are  
set all the digettes, whose certayne  
valewe is wrytten on the ryght hand  
of the table, and the valewe vncer-  
tayne on the lefte hande. So that by  
this table you maye lerne bothe how  
to expresse any number that you lyst  
(yf that it excede not. xi. places) that  
is to saye. lxxx. thousand myllions,  
and so may you by the helpe of it, va-  
lewe all summes proposed vnder the  
sayde number: as for exāple, the sūme  
that I proposed befoze, whiche was  
fyue thousand, two hundred, fyfty &  
seuen, yf you wyll expresse it, take the  
fyfste number (as I speke it) whiche  
is. v. M. whose balower or certayne  
balowe is. v. and his vncertayne va-  
lowe or denomination is. M. fyfste  
you shall seke at the ryght hande, the  
valewer. v. Then seke alonge vnder  
the tytyle of denomination, towarde  
the lefte hande, tyll ye fynde thousā-  
des, and vnder it ryght at the fote of  
the

## Numeration.

the table, is the number of the place, that is the fourth, wherein you must write your dyget or valower 5. Then come to the second parte of the nūber ii. C. whose valewer is 2 and denomination. C. Seke. ii. at the ryghte hande of the table, and go along vnder the denominations, towarde the lefte hande, tyll you come vnder. C. Then loke to þ fote of the table, and there shall you se the number of the place, that is to saye. iii. wherein you must set your digette 2. Then do so by your other two numbers that remaine, and you shall fynde 5 in the seconde place for your fyfty, and 7 in the fyrst place for your. vii. And thus maye you do with other numbers. S. Mayster I thanke you hartely, I perceaue you seke to instructe me mooste playnely and brefly, and not to hyde your knowlege with subtyll wordes, as many do: for this rule is so playn that I can despyre it no playner. And though it seme somewhat longe, yet I  
per-



perceave it a sure waye. M. So is it,  
 & though it be longe, yet it is nother  
 to longe, nother to playne for yonge  
 learners that lacke practyse, for this  
 table is in stede of a teacher, to them  
 that lacke one. But nowe I truste, I  
 haue sayde ynough of Numeration,  
 which after you haue well practysed,  
 then maye you learne forth. S. Sye,  
 in Numeratio I haue well practysed,  
 & am redde to learne forth. M. That  
 is well. But what shuld you nexte  
 learne, can you tell? S. I remeber you  
 said, þat Additiō was next. M. Euen so,  
 & what that is, must you fyrst knowe.

## Addition.



Addition is the re-  
 duction and byn-  
 gyng of two sum-  
 mes or more into  
 one. As yf I haue  
 160 booke in the la-  
 ten tongue, and 136  
 in the greke tongue, and wold know  
 howe many they be in all. I muste  
 write



# Addition.

write those. ii. numbers, one ouer an other, wrytyng the greatest number hyghest, so that the fyrst figure of the one, be vnder the fyrste figure of the other. And the seconde vnder the second, and so forth in order. When you haue so done, drawe vnder them a strayghte lyne, then wyl they stand thus.

160

Now begynne at the fyrste places toward the ryghte hande alwayes, and put together the ii. fyrst figures of those two summes, and loke what cometh of them, wryte vnder them ryght vnder the lyne: As in sayenge, 6 and 0 is 6. Wryte 6 vnder 6, as thus.

136

And then go to the second figures, and do like wayes: as in sayenge, 3 & 6 is 9, wryte 9 vnder 6 & 3, as here you se. And lyke wayes do you with the figures, that ben in the thyrde place, sayeng, 1 and 1 be 2, wryte 2 vnder them, and then wyl

160

136

6

160

136

96

wyl your hole summe appere thus.

160	So that nowe you se, that
136	160 and 136, do make in all,
<u>296</u>	296. S. What, this is very

easy to do, me thynketh I can do it,  
euē syth. There came thzough chepes  
syde. ii. dzoues of cattell, in the fyrste  
was 848 shepe. And in the seconde  
was 186 other beastes. Those two  
summes I must wyte as you taught  
me thus.

	848
Then yf I put the. ii. fyrste	<u>186</u>

figures together, sayenge 6  
and 8, they make 14, That muste I  
wyte vnder 6 and 8, thus.

	848
M. Not so, and here are you	<u>186</u>
twyse deceaued fyrst in go-	14

pyng about to adde together  
ii. summes of sondry thynges, which  
you ought not to do, excepte you seke  
onely the nomber of them, & care not  
for the thynges. For the summe that  
shulde resulte of that addition, shuld  
be a summe nother of shepe, nor other  
beastes, but a confused summe of both.

C. ii.

How

### Addition.

How be it, somtymes you shall haue  
summes of dyuers denominations to  
be added, of whiche I wyl tell you  
anone: But fyrste I wyl shewe you  
where you were deceued in an other  
poynte, and that was in wytyng 14,  
whiche came of 6 and 8, vnder 6 & 8,  
whiche is vnpossyble: For howe can  
two figures of two places, be wryten  
vnder one fygure, and one place? S.  
Truth it is, but yet I dyd so vnder-  
stande you. M. I sayde in dede that  
you shuld wryte that vnder them, that  
dyd result of them bothe together,  
whiche sayenge is always trewe, yf  
that summe do not excede a dygette.  
But yf it be a myrtenōbze, then must  
you wryte the diget of it vnder your  
fygures, as I haue sayde befoze: But  
& yf it be an article, thē wryte o vnder  
thē, & kepe the article in your mynde.  
And therfoze when you haue added  
your seconde figures, whiche occupy  
the place of tennes, you shall put that  
i therto, whiche you kepte in your  
mynde:



mynde: for though it were 10 in dede,  
yet in þ place it is but as 1, bycause  
that euery 1 of that place is tenne, for  
it is the place of tennes. And in lyke  
maner, yf you haue in þ seconde place  
so great a nomber, that it amounteth  
aboue 9, then write the dyget, and re-  
serue the article in your mynde, euer  
addynge it to the nexte place folow-  
ynge: and so of all other places, howe  
many so euer you haue. And yf you  
haue a myrte nomber, when you haue  
addyd your last figures, then write þ  
digette vnder the laste fygures, and  
the article in the nexte place beyonde  
them: So shall your nōber resultyng  
of addition, haue one place moze then  
the nombres whiche you shulde adde  
together. S. Now do I perceaue you,  
and the reason of this is (as I vnder-  
stande) bycause that no one place can  
cōtayne aboue 9, which is the grea-  
test figure that is. And then all the  
tennes or articles must be put to the  
nexte place folowynge: for euery place  
C.iii. (as I

# Addition.

(as I may se) exceedeth the other place  
nexte before hym by .x. Nowe (yf it  
please you) I wyll returne to my ex-  
ample of cattell. But I remeber you  
sayde I myghte not adde summes of  
sondyr thynges together, and that  
myght I se by reason. M. Trowth it  
is, yf you seke the sūme of any thyng,  
but yf you only seke a sūme, and haue  
no respecte to the thyng, then were it  
better to name the summe only with-  
out any thyng: as in sayenge 848,  
without namynge shepe or any thing  
els. And lyke wayes 186 namynge no-  
thyng. Nowe let me se, how can you  
adde those two sūmes. S. I must fyrst  
set them, so that the two fyrst figures  
stande one ouer an other, and so then  
drawe a lyne vnder them bothe. And  
so lyke wayes of other figures, set-  
tyng all wayes the greattest number  
hygheste thus.

Then muste I adde 6 to 8  
whiche maketh 14, that is  
a myxte number, therfore must I take  
the

848

186

the dyget, whiche is 4, and wyte it vnder 6 and 8, kepyng the article 1 in my mynde, thus.

848

Then do I come to the second figures, addynge them toge-

186

4

ther, sayenge: 8 & 4 make 12 to whiche I put the 1 reserued in my mynde and that maketh 13, of whiche number I wyte the dyget 3 vnder 8 and 4, & kepe þ article in my mynde, thus

848 Then come I to the thyrde fi-

186 gures, sayeng: 1 and 8 make

34

9, & 1 in my mynde maketh 10,

Sy? shall I wyte the cyphar vnder 1 and 8: M. Xea. S. Then of 10 I wyte the cyphar vnder 1 and 8, and kepe þ article in my minde. M. What nede that, seyng there foloweth no more figures: S. Sy? I hadde forgotten, but I wyll remember better hereafter. Then seyng I am come to the laste figures, I muste wyte þ cyphar vnder them and the ar-

848

186

1034

the cyphar thus.

C.iiii.

M.



# Addition.

M. So now you se, that of 848 and 186 addyd together, there amounteth 1034. S. Now I thynke I am perfect in Addition. M. That wyl I proue by this example. There are .ii. armies of souldyers, in the one are 106800, & in the other 9400, Howe many are there in both armies say you? S. fyrst I set them one ouer an other, begynnyng with the fyrste nombres at the ryght hande thus.

106800

But the nether nōber wyl not matche the ouer nōber.

9400

M. That forceth not. S. Then do I adde 0 to 0, and there amounteth 0, that muste I wyte vnder the fyrste place thus.

106800

M. Well sayde. S. Then lyke wayes in the seconde place I adde 0 to 0, and there aryseth 0, whiche I write vnder the second place thus.

9400

0

Then I come to the thyrde place, sayenge : 4 and 8 make 12, of whiche I write

106800

9400

00

the

the dygette 2, and kepe the article 1  
in my mynde, thus.

106800

Then adde  $\text{I}$  9 to 6, whi-  
che maketh 15, to that  $\text{I}$

9400

---

200

adde the article 1, that was

in my mynde, and it is 16,  $\text{I}$  write 6  
vnder 6 and 9, & kepe 1 in my mynd  
thus.

106800

M. Why do you not write  
bothe figures, seyng you  
are come to the laste couple

9400

---

6200

of nombres? S. Nay, reason sheweth  
me that  $\text{I}$  must adde that article that  
is in my mynde, vnto the nexte figure  
of the ouer summe, though there be no  
more in the nether summe. M. That  
is well cōsidered, then do so. S. Then  
saye  $\text{I}$ , 0 in the ouer summe and 1 in  
my mynde make 1, that  $\text{I}$  write vn-  
der 0: Then foloweth there 1 in the  
ouer summe, whiche hath none to be  
addyd to it, for there is none in the  
nether summe, nor yet in my mynde:  
therfore  $\text{I}$  thynke  $\text{I}$  muste write that  
even as it is. M. Yea. S. Then doth

C.v.

my

# Addition.

my hole sūme appere thus. 106800

M. Yf you warke this, you 9400

haue learned perfectly the 116200

cōmyn addition of all summes, which are of one denomination, so that you obserue this also, that in Addition you muste haue two nōbzes at the leaste : oꝛ els how can you saye that you do adde : And euer let̃ greatest nōmbze be wꝛitten hyghest, foꝛ ḡ is the beste waye, though it be not necessary. And foꝛgette not this, that yf you haue many numbers to adde together, you shall haue oftentimes an article of a greater valewe then 10, somtymes 20, somtymes 30, somtymes moze, yea paduētūre 100. Therfoze as you dyd w̃ the article 10, so do w̃ thē, reseruing them in your mynde & addyng to the nōbze next folowynḡ so many as theyꝝ balewer oꝛ balewe certayne is, that is to saye : 2 foꝛ 20, 3 foꝛ 30, & so foꝛth of other. But yf the article be 100, then must you not adde the article to the next figures folowynḡ

ynge



ynge, but to the thyrde figures from them: as I wyll shewe you anone by example. And yf it chaunce the nōber to be suche, that it do comprehende two sondry articles (that is one of tennes, and an other of hundredes) then must you reserue them bothe in your mynde, and adde the article of tēnes to the figures that folow next, and the article of hūndredes to the figure of the thyrde place from thence.

Now take this example for  
all. I wolde adde these, *liiii.*  
summes in one, which I set  
after this maner. Then do  
I begyn & gether the summe  
of the fyrste figures whiche  
cometh to 107. For fyrste I  
take 9 there. *x.* tymes, and  
that is 90: then 9 and 8 is  
17, that is in all 107: Of  
whiche summe I wyte the  
7 vnder the fyrste figures,  
and then haue I an article  
of 100 in my mynde, which  
other

4889

4599

2299

3699

2399

4090

1099

3198

299

699

899

499

389

### Addition.

other I muste kepe in my mynde, tyll  
I come to the thyrde figures, whiche  
are in the rounes of hundredes: or els  
I maye, for fere of forgettyng, write  
one vnder the thyrde rewe of figures  
makynge two lynes, as you se here  
done. And then muste I write the di-  
gettes vnder the loweste lyne, & this  
is the surest waye when the summe is  
so greate that the additiō of one rowe  
passeth 100. When I haue so done,  
I must then come to the seconde rowe  
of figures, and adde them together,  
which doth make 115, of which sūme  
I write the digette 5 vnder the same  
seconde rowe, and then haue I an ar-  
ticle remaynyng of two figures, of  
whiche the one (that standeth for 10)  
must be added to the seconde or nexte  
place after the, that I dyd laste adde.  
And the other (that standeth for 100)  
must be added to the thyrde place fro  
thence. S. That is to saye, the fourth  
place from the fyrste lyne or rowe of  
figures. M. Euen so. And then wyl  
the

the summe appere thus.

Then adde the thyrde rowe of figures with the two vnitees betwene the lynnes: and the summe amounteth to 50, of which I wyte the cyphre vnder the same thyrde rowe, and the 5 vnder the nexte figures toward the lefte hande. Then I adde the figures of the fourth rowe with the 1 & 5, that are vnder them betwene the two lynnes, and they make 29: then write the 9 (that is the dygette) vnder the fourth place, and the 2, that is the article beyonde it toward the lefte hande. So those summes do make 29057. S. This semeth somewhat harde, by the reason of so many nombres together. How be it I thynke yf I do often proue euen with this same example, I shall be able to

4889

4599

2299

3699

2399

4099

1099

3198

299

699

899

499

389

11

51

29057

do



### Addition.

do so shortly with any other summe.  
M. So shall you: For it is often practised that maketh a man quicke and cyppe in all thynges. But bycause of suche greatesummes, in whiche there may chaunce to be sonie errour, I wyll teache you, how you shall proue whether you haue done well or no. Sco. That were a greateshelpe and ease.  
M. Begyn fyrst with the hyghest nombre and then all the other orderly, and adde them together, not hauinge regarde to theyr places, but as though they were all vnities, & styll as your nōber encreaseth aboue 9, cast away 9. And then go forth, euer castynge away 9, as often as it amounteth therto. And so do tyll you haue gone ouer all the numbers that you entended fyrste to adde, and what so euer remayneth after such addition, & castynge awaye of 9, wyte it in some boyde place, by the ende of a lyne, for the better remembraunce. And then putte together the figures that resulte

sulte of the addition, styll castynge a-  
 way 9 also : And then 2, that remay-  
 neth, wryte at the other ende of 2 lyne,  
 and yf those two be lyke, then haue  
 you well done, but yf they be vnyke,  
 then haue you myssed. As for exam-  
 ple in this present summes: The fyrst  
 figure of the ouer lyne is 9, let hym  
 go: then 8 and 8 is 16, take awaye  
 9 and there remaineth 7, adde to it  
 4 that foloweth, and that maketh 11  
 from whiche yf you take 9 there re-  
 steth 2. Then come to the next rowe,  
 whose fyrst and secōde number are 9,  
 therfore ouerpasse them bothe & take  
 the 5 to the 2 which dyd remayne in  
 the fyrste rowe, that maketh 7, putte  
 therto the 4 folowynge, that maketh  
 11, thence take 9, & there remaineth  
 2. Then go to the thyrde lyne, whose  
 two fyrst nombres you maye let passe  
 bycause they are nynges: then take the  
 two 2, whiche with the other 2 that  
 remayned in the seconde rowe, make  
 6. Then go to the fourth rowe whose  
 ii. fyrst

### Addition.

ii. fyrste numbers let go, and take the 6 to the 6 that remayned, and that maketh 12, take awaye 9, and there resteth 3, whiche with the 3 that is nexte, maketh 6. And so go thorough all the other numbers, you shal fynde þ there remayneth 5, after you haue cast awaye 9 as often as you fynde it, therfore wryte 5 at one ende of a lyne in a voyde place thus. 5—  
Then gether all the fygures of the total sume which is vnder the lowest lyne, and caste awaye 9 as often as you fynde it: as thus: 7 and 5 make 12, take awaye 9 and there resteth 3, to that yf you adde the 2 that is last (for you maye let go the 9) then doth it make 5, whiche you muste wryte at the other ende of the lyne, that you made in the voyde place, and it wyl be thus, 5—5. And then you se þ those two figures be like, wherby you maye knowe that you haue done well, and so maye you proue in any other. S. Yf it please you I wyl proue  
in an



in an other summe. M. With a good  
wyl. S. Then wyl I take one of your  
fourmar examples, whiche was this.

fyrst in the hyghest lyne	106800
8 and 6 make 14, then	9400
9 taken awaye remaine	<hr/> 116200

5, to which I adde the 1  
that foloweth, and that maketh 6.  
Then come I to þ second lyne, where  
I fynde fyfte 4, whiche with 6 ma-  
keth 10, from that I take 9, & there  
resteth 1, the nexte figure is 9 and  
therfore I let hym alone: so I fynde  
1 remainyng, which I set at þ ende  
of a lyne thus 1—— Then I come  
to the totall sūme, and there I muste  
fynde, that all the figures put toge-  
ther make 10, from whiche I take 9,  
and there resteth 1 also, which I put  
at the other ende of þ lyne thus 1——1  
And bycause they be lyke, I know I  
haue well added. M. So you knowe  
now bothe how to adde two summes  
or moze together. And also howe to  
proue whether you haue done well or

**D**

no:

### Addition.

no : whiche thyng also you maye do  
by Subtractiō. But bycause you can  
not yet skyll of it, I wyl let that passe  
tyll anone, and wyl teache you nowe  
how to adde sūmes of dyuers deno=  
minations : which thyng can neuer  
be, but when the one denominatiō is  
suche, that it cōtayneth the other cer=  
taine tymes. And yet you shall adde  
them to the other, not after this sorte,  
as you dydde them that were of one  
denomination: but after such a sorte,  
as I wyl now shewe you: That is to  
saye, yf you haue a summe of dyuers  
denominations, then loke that ye set  
euery denominatiō by hym selfe with  
some note or figure of his denomina=  
tion, as they be wonte to be wrytten.  
Then wryte your other summes so vn=  
der that fyrst, that euery one be set vn=  
der the other of the same denomina=  
tions: As for an example. Yf your de=  
nominations be poundes, shyllynge,  
& pennies, wryte poundes vnder pou=  
des, shyllinges vnder shyllinges,  
and

& pennys vnder pēnys: And not shyl-  
lynges vnder pennys, noꝝ pēnys vn-  
der poundes. S. Now that you haue  
spoken it, me thinketh it neded not to  
warne me of it, foꝝ it were agaynste  
reason so to confoude sūmes: but yet  
yf you had not spoken of it, peraduen-  
ture I shuld haue ben deceaued in it.

M. Yf you do saye it is so playne, I  
wyl speake no moze of it, but with  
an exāple make the matter to appere  
euydently. Ipyste one man oweth me  
22 li. 6 s. 8 d. Another oweth me  
5 li. 16 s. 6 d. And another oweth me  
4 li. 3 s. I wolde knowe what this  
is all together. Therfoze must I fyrst  
set downe my greatest sūme, and then  
the other, euery one vnder his deno-  
mination, agreynge to the greattest  
summe, as thus.

Then must I begynne  
at the smalest numbꝛes  
whiche muste alwayes  
be set nexte the ryghte  
hande, and adde them

li.	s.	d.
-----	----	----

22	6	8
----	---	---

5	16	6
---	----	---

4	3	
---	---	--

D.li.

toget



### Addition.

together. And yf the summe of them  
wyl make one of the next denomina-  
tion, then must I kepe it in my mynd,  
tyll I come to that place : or elles for  
more easines write it vnder þ place be-  
twene the double line, and vnder that  
fyfste place must I note the resydw  
( yf there remayne any ) of the same  
denomination, but yf there remayne  
none, the nede I to write vnder it no-  
thyng. And this is all that you must  
marke in this addition : for all other  
thynges are lyke to the other maner  
of addition, befoze mencioned. Ther-  
foze the cheyfest poynte of this addi-  
tion is, to knowe the valewes of cō-  
men coynes, and rated summes : As  
how many shyllinges be in a pound,  
how many pennys in a shyllinge. Of  
whiche and of other lyke thynges I  
wyl instructe you here after, in tea-  
chyng of Reductiō. But now I may  
not disturbe your witte from þ thyng  
that we are about. Therfoze lette vs  
retourne to that fourtyer example,  
which

# Addition.

27

which I proposed of.iii. detters, whiche summes when I had set orderly, they stode thus with a double line vnder the.

li. s. d.

22 6 8

Then to adde them vn to one sume, must I begyn at the ryght hand, where the smalest deno-

5 16 6

4 3

mination is, and adde them together fyrste sayenge, 6 & 8 make 14, nowe seyng these 14 are penne s, and that 12 d. make one shyllynge (which is þ nexte valewer) I take away 12 from 14, & there resteth 2, whiche I write vnder the penne s, and for the other 12 (whiche make 1 shyllynge) I write 1 vnder the tytyle of shyllynge s, thus.

Then do I adde all the shyllynge s together, & fynde them 25, to which I adde the 1 betwene þ two lines, and that maketh 26: but bycause þ 20 s. do make 1 li. I

li. s. d.

22 6 8

5 16 6

4 3

1

2

take away 20 from 26, and for that

D.iii. 20

# Addition.

20 I write 1 vnder the poundes, betwene the two lynnes: and the other 6 (that remayneth) I write vnder the Myllpnces thus.

li. s. d.

Then come I to the poundes addynge them all together, and fynde them to be 31, thereto I adde the 1 betwene the. ii. lynnes, and that maketh 32

22 6 8

5 16 6

4 3

1 1

6 2

whiche summe I write downe hole, bycause there is no greater denomination. And then my hole summe appereth thus.

li. s. d.

So is my totall summe

22 6 8

32 li. 6 s. 2 d. And this

5 16 6

may you proue in an o-

4 3

ther lyke sume. S. Then

1 1

wyll I caste the hole

32 6 2

charge of one monthes

cōmens at Oxfozde, with battelynge

also. M. Go to, let me se how you can

do. S. One wekes cōmens was 11 d.

ob. q. and my battelynge that weke

was 2 d. q. q. The second wekes cō-

meng



mens was 12 d. & my battelyng 3 d.  
The thyrde wekes comens 10 v. ob.  
& my battelyng 2 d. q. c. The fourth  
wekes comens 11 d. q. and my batte-  
lyng 1 d. ob. c. These. iiii. summes  
wolde I adde into one hole summe, &  
therfoze I wyll set them one ouer an  
other thus.

But I had forgothē,  
I shuld haue set the  
greateste summe hy-  
ghest. M. So is it co-  
menly best, how be it  
here it forceth not, &  
in such sumes as this  
is, that go by order of  
wekes, dayes, or yea-  
res, it is better to kepe

d.		
11	ob.	q.
2		q. q.
12		
3		
10	ob	
2		q. c.
11		q.
1	ob.	c.

that order then to alter them, and to  
sette the greatest nombze hyghest, for  
that serueth for suche summes as go  
not by order. S. Then yf I haue sette  
them well ynough I wyll begyn to  
adde them thus. Fyrst of the smaleste  
valeur at the ryght hand, whiche

D. iiii. are

# Addition.

are called ceys, I fynde 2, & seynge þ  
2 ceys do make 1 q. I wyll write no-  
thyng vnder the ceys, but wyll write  
1 q, for the 2 ceys vnder the kewe  
betwene the lynes, af-

ter this maner. Then  
come I to the next va-  
lewers where I finde  
2 q. & to them I adde  
the q, that is betwene  
the lynes, and so are  
they 3 q. but bycause  
2 q. maketh one q̄. I  
wyte one q̄ vnder the  
farthynges betwene þ  
lynnes, and the q that  
remayneth muste I  
wyte <sup>betwene</sup> betwene the ne-  
thermost lyne, vnder  
the kewe thus.

Then come I to the  
farthynges, where I  
fynde 3, and the other  
q̄ that is betwene the  
lynnes maketh 4 q̄.

ð:			
11	ob.	q̄.	
2		q̄. q.	
12			
3			
10	ob.		
2		q. c.	
11		q̄.	
1	ob.		c.
1		q.	
1			
ð.			
11	ob.	q̄.	
2		q̄. q.	
12			
3			
10	ob.		
2		q. c.	
11		q̄.	
1	ob		c.
		q̄. q.	
		q.	

betwene

# Addition.

29

and bycause 4 ſ make iuste 1 ſ. I  
 Shall write nothyng vnder the far-  
 thynges, but must write 1 vnder the  
 pēnes betwene the lynnes. Then must  
 I adde the halfe penne together, of  
 whiche there are 3, but seynge that 2  
 ob. make 1 ſ. I muste write 1 vnder  
 the pēnes betwene the lines, but how  
 Shall I do it, for there is 1 alredy: M.  
 Haue you forgottē how I dyd in ad-  
 dition of the greate sūme befoze: you  
 must set it vnder þ other, so Shall they  
 bothe stande for 2: for yf you shulde  
 set it befoze or behynde the other, they  
 shulde make 11. S. I remēber it now,  
 and I perceauē the reason. Then I  
 wyl write 1 ob. vnder þ halfe pēnes,  
 and for the other 2 halfe pēnes whi-  
 che make 1 ſ. I write 1 vnder the  
 pēnes. Then come I to the penne, &  
 fynde that there are of them 52, then  
 put I to them the 2 betwene the ly-  
 nes, and that maketh 54, whiche a-  
 mouēteth to 4 ſ. 6 ſ. the 6 ſ. I must  
 write vnder the pēnes, and the 4 ſ.

D.v.

I



# Addition.

I muste sette (I suppose) farther to-  
warde the lefte hande by them selfe.  
M. Euen so. S. Then appereth all my  
addition thus.

	5.	
And the summe is	11	ob. q̄.
4. 5. 6. 5. ob. q. M.	2	q̄. q.
Nowe haue you	12	
done this well.	3	
But tell me, why	10	ob
dyd you writ kewe,	2	q. c.
cee, thus q. c. and	11	q̄.
not rather thus q̄,	1	ob. c.
as the fashyon is?	1	q̄. q.
Scol. Bycause I	5. 1	
thought it was p̄	4	6 ob. q.
best waye for deue		

gatherynge of euery denominatiō by  
hym self. M. So was it in dede. Well  
now, can you tell howe to proue this  
addition (and suche other lyke of dy-  
uers denominations) & to trye whe-  
ther you haue done well or no? S. I  
wolde I coulde. M. That shall you  
do by this meanes: fyrste as you dyd  
begyn to adde, so reken agayn eue-  
ry de-

ry denomination by it selfe, and whē  
 you fynde so many small, y do make  
 any other denomination, let them go  
 and kepe in mynde only the resydewe  
 that wyl make no greater denomi-  
 natiō, and loke whether there be any  
 such lyke valewe vnder y nether line,  
 and yf there be, you haue well done,  
 and so go forth from one denomina-  
 tion to an other vnto the ende. But  
 here must you note that in gathering  
 of the sūmes you must reckon those fi-  
 gures that are wyrtten betwene the  
 lynes with them that are wyrtten a-  
 boue them, as for an example. I wyl  
 examyne that sūme, that

li.	ſ.	ſ.
22	6	8
5	16	6
4	3	
1	1	
32	6	2

I dyd last adde, whiche  
 stode thus.  
 fyrste I fynde 6 and 8  
 which maketh 14, from  
 which I take 12, by cau-  
 se it maketh one of the  
 nexte denomination, and there remay-  
 neth 2, and vnder that place I se a  
 lyke figure, therfore I knowe that to  
 be

# Addition.

be well done. Then come I to the. 5.  
 where I fynde 1, 3, 16, and 6, that  
 maketh 26, I cast away 20, for they  
 make an other denomination, that is  
 to say, poundes, & the 6 which remay-  
 neth is lyke to the 6 that is witten  
 vnder them, benethe the loweste lyne,  
 therfore that is well done also. And  
 thence I go to poudes, where I fynd  
 1, 4, 5, 22, & is 32, to whiche sūme a-  
 greeth another like vnder it, therfore  
 I iudge all well done. S. I perceaue  
 reaso in this probatiō, now wyl I at-  
 tempt the same in p̄  
 sūme p̄ I dyd adde,  
 which when I had  
 ended adding, stode  
 thus. ffirst amon-  
 gest the cees I fynd  
 but 2, whiche make  
 1 q. euen therfore  
 there must nothyng  
 be vnder the lyne for  
 then: and amongst  
 the kewes, I fynde  
 3 of

5.

11 ob. q.

2 q. q.

12

3

10 ob.

2 q. c.

11 q.

1 ob. c.

1 q. q.

5.

1

4 6 ob. q.



3, of whiche 2 make 1  $\text{q}$ . therfore  $\text{I}$  let them go, and the 1  $\text{q}$ . that is left hath an other lyke vnder his place, therfore that is well done. Then the farthynges are iust 4, which make 1  $\text{d}$ . and therfore  $\text{I}$  let them go. Amongest the halfe pēnes there is one odde for 2 must  $\text{I}$  cast away, bycause they make 1  $\text{d}$ . and vnto it answereth a lyke summe vnder it. The pennes are 54, from whiche  $\text{I}$  take awaye 48,  $\text{I}$  make 4.  $\text{s}$ . and the 6 remaynyng agree to a lyke figure sette vnder them. And laste of all remayneth the 4  $\text{s}$ . which the abiected pēnes dyd make, so  $\text{I}$  perceauē that  $\text{I}$  haue well done. Now this wyll  $\text{I}$  not forgette, but wyll this examinatio serue in all addition:  $\text{M}$ . It serueth for all additio of sundry denominatiōs, yf the additio be made with two lynes (as these were) els it wyll not serue, bycause  $\text{I}$  those summes which are here addyd betwene the lynes in addition, by one lyne are vnderstande and not wryten, but  $\text{I}$

### Addition.

but I lette that wayes passe, bycause  
as it is comyn, so is it moze deceaue-  
able then this wayes, namely yf a  
mans memory be other dulle, other  
troubled. S. yet it were good to know  
that wayes also. M. Yf you desyre to  
knowe it, this it is in fewe wordes:  
do every thyng as you dyd in this  
sorte, saue that where you made here  
two lynes, you shall make there but  
one, and those summes that you dyd  
here wryte betwene þ lynes, you must  
kepe in your memory and adde them  
(as you dyd here) eche one when you  
come to his place. S. Then they dyf-  
fer not but in this, that this addition  
with two lynes leueth nothyng to  
memory, but wryteth downe all: and  
the other waye comytteth certayne  
nōbers to memory, as you taught me  
in the fyfste examples of addition of  
small summes of one denomination.  
But what yf a man vse it (as you say  
men do comenly) how shall it be exa-  
mined? M. Seynge you are so desy-  
rous

cous of it I wyl shewe you bothe an  
example of the addition, and also the  
maner to examyne it. I propose these  
iii. summes to be added li. s. d.  
and I gather fyrste the  
pennes (as I dyd in the  
other sorte) and I fynd  
of them 8, 3, 9, that is

li.	s.	d.
12	8	9
6	7	3
3	6	8
<hr/>		

20, of whiche summe I bate awaye  
12, which make 1 s. and kepe that 1  
in my mynde, and the rest that is 8, I  
write vnder the penes. Then do I  
adde the shyllynges together, & fynd  
of them 6, 7, 8, that is 21. wherof I  
bate 20, that make 1 li. which I kepe  
in my mynde, and to the other 1 that  
remayneth, I adde that 1 that came  
of the penes, and was  
in my mynde, whiche  
make 2: & them I write  
vnder the shyllynges.

li.	s.	d.
12	8	9
6	7	3
3	6	8
<hr/>		
22	2	8

Then do I reckon the  
poundes together 3, 6,  
12, that is 21, and to them I adde 1  
in my mynde that remayned of the  
shyllyn



### Addition.

Shyllinges, which make 22, them do  
I write vnder the poundes: and then  
my summe totall appereth to be 22 li.  
2 s. 8 d. Now to examyne this summe  
(and all lyke) you shall do thus. First  
begyn at the lefte hand with the pou-  
des, & take from them, that are aboue  
the lyne 9 as often as you can, then  
that þ remayneth shall you double,  
then ioyn it with the Shyllinges, and  
take awaye 9 from that, as often as  
you can, and what so euer remayneth  
you shall take for it 3 tymes so moch  
and putte to the pennies: then take fro  
all that summe 9 as often as you can,  
& what so remayneth after you haue  
withdrawen 9 as often as you can,  
wryte that at the ende of a lyne, as I  
taughte you in other addition. And  
then come to the summe vnder the lyne,  
begynnyng with the poundes, and  
do euen as you dyd with the summes  
aboue the lyne, tyll you come to your  
pennies, and yf the figure of the summe  
that remayneth after castynge away  
9 (as

9 (as often as you can) do agre with the other that remayned before of the other summe, whiche you dyd wyte at the ende of the lyne, then haue you done well, els not: & for an example I wyl examyne that last summe which was thus.

	li.	s.	d.
fyyste I shall begynne	12	8	9
at the lefte hande with	6	7	3
the poundes, puttynge	3	6	8
them together, whiche	22	2	8
make 21, in which summe			

I fynde 9 twyle, for twyle 9 is 18, & I deducte & there remayneth 3, that 3 muste I double (as I sayd) bycause it is the remayner of the poundes, and it wyl be 6. Then gether I the summe of the ~~pennes~~ <sup>pennes</sup>, whiche is 21, to the whiche I adde the fore sayde 6, and then is it 27, wherin I fynde 9 thre tymes, and there remayneth nothing. This remayner shulde I take.iii. tymes, but.iii. tymes nothyng is nothyng: therfore in this place is there nothyng lefte to be added to p pēnes,

E.

ther=

*Shiawings*

Addition.

therfore muste I take the summe of  
pēnes aboue, which is 20, frō thence  
yf I take 9 twyse, there remayneth  
but 2, whiche I put at the ende of a  
lyne, thus. 2 ——— Then I come to  
the poundes of the vnder nōber oꝝ to-  
tall summe, and there I fynde 22, frō  
whiche I take awaye 9 twyse, and  
there remayneth 4, that 4 I double  
and it is 8, then do I adde that 8 to  
the shyllynges, and it maketh 10, frō  
whiche I withdraue 9, and there re-  
steth 1, then do I take that 1 thre ty-  
mes, and it maketh 3, whiche I adde  
to the 8 d. & it maketh 11, frō which  
yf I bate 9, there resteth 2, which is  
equall to the nōber noted at the ende  
of the lyne, and therby I perceaue y  
I haue done well. S. But I do not se  
the reason of this. M. No, no moze do  
you of many thynges els, but hereaf-  
ter wyl I shewe you the reasons of  
all Arithmetical operations, for this  
I iuge to be y best trade of teaching,  
fyꝛst by summe bꝛefe pꝛeceptes to en-  
structe



fructe a learner sumwhat in the vse  
of the arte, befoze he learne þ reasons  
of the arte, and then maye you after-  
warde moze soner make hym to per-  
ceauie the reasons: for harde it is for  
to occupye a yonge learned wytte, w  
both the arte and the reasons of it all  
at ones: how be it he shall neuer be  
cōnyng in dede in an arte, þ knoweth  
not the reason of euery thynge tou-  
chyng it. S. Yet at the least, I praye  
you show me why dyd you write your  
nōbze that remayneth (after you had  
withdrawen al the nynes) at the ende  
of a lyne, for I sawe no reason why  
þ lyne dyd serue? M. Dyd you euer  
marke a carpenter when he wrought?  
S. Yea, many tymes. M. And haue  
you not sene hym when he hath taken  
measure of a bozde, that he hath pic-  
ked it, and hath with a twyche of his  
hande drawen a lyne from the picke  
that he made? S. Yes I haue marked  
that, and haue sene some make.iii. or  
iiii. lynes by the picke, and some also  
E.ii, haue

## Addition.

haue I sene make a crosse by it, but that I perceaued was for the easy fyndyng of theyr prycke. M. And euen so is this lyne, for the easy fyndyng of your remayner, and therfore some do make a crosse thus.

And set the one remayner aboue the crosse, and the other vnder the nether parte of the crosse, as yf I shulde set my two remayners thus.



But there is an other sorte of profe of addition, to whiche the crosse serueth moze meter. And it is, when the addition is of dyuers denominations, and I wolde examyne euery denomination by it selfe, which wayes though it be not moch vnylike to the fyrste profe, that I brought of such dyuers summes, yet I wpll declare it, least you shulde thynke that I wolde hyde it from you: you muste make so many lines in your crosse as you haue sondry denominations, as yf you haue but 2 denominations, then



then you maye make it thus:  
that the ouer parte and the  
nether parte maye serue for  
one denomination, and the two sydes  
for the other. And yf you haue 3 de-  
nominations (as poundes, shyllinges,  
and pennies, then must you make thre  
lynes, thus.

The vpryght lyne may serue  
for the poundes, and the hy-  
ghest thwarte lyne for shyl-  
lynges, and the lowest for pennies, as  
for example, I wyll take a sūme thus  
added, for the proue of the whiche,  
bycause it contayneth thre denomina-  
tions, I must make a crosse of 3 ly-  
nes thus.

li.	ſ.	d.	
16	12	5	2
12	8	1	3
9	2	7	1
38	3	1	2

Then I reken fyrste at the ryghte  
hande the pennies 7, 1, 5, make 13,  
from whiche I take 12 for the nexte



### Addition.

denomination, that is to saye a shyl-  
lynge, and there resteth 1, whiche I  
must write at one ende of the nether  
thwartelyne. Then I gether þe summe  
of the shyllinges 2, 8, 12, which make  
22, to them I put 1 that I toke of the  
penies, & that maketh 23, from those  
I take 20, the quantite of the nexte  
greater denomination (that is to say  
a pound) and there resteth 3, whiche  
I write at the ende of þe ouer thwartelyne.  
Then I adde together the pou-  
des, 9, 12, 16, whiche make 37, to the  
I adde the 1 that came of the shyllyn-  
ges, and then there is 38, wherein I  
fynde 4 tymes 9 and 2 ouer: that 2  
I write on the vpryghtelyne. Then  
I come to the totall summe, and exa-  
myne it begynnynge at the penies,  
where I fynde but 1, & can not take  
9 from hym, therfore I set hym at the  
other ende of the nether thwartelyne.  
Then come I to þe shyllinges where  
I fynde only 3, whiche bycause it is  
lesse then 9, I set it at the other ende  
of

of the lyne of Shyllinges, that is the ouerthwarte lyne. Then of the 38 li. I take out 4 tymes 9 (whiche is 36) & there remaineth 2, whiche I write vnder the vpryghte lyne, then I consider euery number, comparynge it to the number that is agaynst it: and bycause I fynde them to be euer one lyke his matche, I knowe that I haue well done. S. This crosse I pceaue doth serue for those thre denominations, poundes, Shyllinges, pennies: but what yf I hadde, ob, q, q, and c. M. You thynke you be at Oxforde styll, you byynge for the so faste your q, and c. These thre lynes (as I haue sayde) doth serue for thre denominations, such as they be: as here they do serue for poudes, Shyllinges, & pennes: but yf you haue no poundes in your summe, then maye they serue for Shyllinges, pennies, and halfe pennes, yea for q, q, and c, yf you haue no greater denomination, so that you remember that the vpryght lyne serueth for the

E.iiii. grea-

## Addition.

greatest denomination, & the hyghest  
thwart lyne for the nexte, & the lowest  
for y<sup>e</sup> leaste. And so yf you have foure  
denominations, you must make your  
crosse with so many lynes,  
And yf that your summe be of  
moze denominations, make so  
many lynes in your crosse.  
And thus wyl I make an en-  
de of Addition.



### Examples of addition.

li.	ſ.	li.	ſ.	d.
262587	6	340.	17	10
41635	12	28	6	8
28124	2	13	13	4
471	4	382	17	10
<u>332818</u>	4			

### The proofes

<del>7</del>	4
<del>4</del>	8
<del>4</del>	1
<del>7</del>	4



**A**n other example.

li.	ss.	d.	q.	
22	11	6	2	6
2	0	3	4	5
1	0	1	0	1
1	0	1	0	1
24	14	1	1	6

**S**ubtraction. Sco.



When haue I learned the two fyrste kyndes of Arithmetike, nowe (as I remēber) doth folowe Subtractiō, whose name me thynketh doth soude contrary to Additiō. M. So is it in dede: for as Addition increaseth one grosse sume, by byngynge many in to one: so contrarype wayes Subtraction dimynyssheth a grosse summe by withdrauynge of o-ther from it: so that Subtraction or rebatynge is nothyng els, but an arte to withdraue and abate one summe fro an other, that the remayner maye appere. S. What call you the remay-

E. v. ner?

## Subtraction.

ner? M. You maye perceave by the name. S. Some thynketh, but yet it is good to aske the trouth of all such thynges, least in trusting to my owne coniecture I be deceaued. M. So is it the surest waye. And as I se cause, I wyl styl declare thynges vnto you so playnely that you shall not nede to doubt. How be it, yf I do ouer passe it somtymes (as the maner of men is to forgette y<sup>e</sup> small knowlege of them to whome they speake) then do you put me in remembraunce your selfe, & that waye is sureste. And as for this worde that you laste asked me, take you this description: The remayner is a summe lefte after dewe working whiche declareth the excesse or difference of the two other numbers: as yf I wolde deducte 14 out of 18, there shulde remayne 4, whiche is called the remayner, and is y<sup>e</sup> difference betwene those two numbers 14 and 18. S. I perceave then what subtraction is. Nowe resteth to knowe the arte to worke

Remay  
ner.

wozke by it. M. That shall you do by  
this meanes : fyrste you must consy-  
der, that yf you shulde go aboute to  
rebate, you muste haue two sundry  
summes p<sup>ro</sup>posed, the fyrste which is  
your grosse summe o<sup>r</sup> sūme total, and  
it must be set hyghest, and then the re-  
batement o<sup>r</sup> sūme to be withdra<sup>w</sup>en,  
whiche muste be sette vnder the fyrste  
(whether it be in one parcel o<sup>r</sup> in ma-  
ny) and that so, that the fyrste figu-  
res be one iuste ouer an other, and so  
the seconde, and thyrde, and all other  
folowynge, as you dyd in Addition:  
then shall you drawe vnder them a  
lyne, and so are your sūmes dewly set  
to begyn your wo<sup>r</sup>kyng. Then be-  
gyn you at the ryghte hande (as you  
dyd in Addy<sup>ti</sup>on) and withdra<sup>w</sup>e the  
nether nomber out of the hygher, and  
yf there remayne any thynge, wryte  
that right vnder them beneth þe lyne,  
and yf there remayne nothynge (by  
reason that the two fygyres were e-  
quall) then wryte vnder them a cy-  
phre



# Subtraction.

phze of nought. And so do you with  
all the other figures, euer more aba-  
tinge the nether out of the hygher,  
and wyte vnder them the remainer  
styl, tyll you come to the ende. And so  
wyl there appere vnder þ lyne what  
remayneth of your grosse sūme, after  
you haue deducted þ other sūme frō  
it ( as in this example ) I receaued of  
your father 48 s. of whiche I haue  
layde out for you 36 s, nowe wold I  
knowe what doth remayne, and ther-  
fore I set my nombers thus in order,  
I wylte I wyte the greatest summe, &  
vnder hym the lesser, so that the figu-  
res at the ryght syde be euen one vn-  
der an other, and so the other thus.

8. Then do I rebate 6 out of 8,  
4 8 and there resteth 2, whiche I  
3 6 wyte vnder them ryght beneth  
the lyne, thus.

Then I go to the seconde fi- 4 8  
gures, and do rebate 3 out of 3 6  
4, where there remayneth 1 2  
whiche I wyte vnder them ryghte,  
and

# Subtraction.

39

and then the hole sūme and operatiō  
appereth thus.

Wherby it appereth, that yf I 48  
withdawe 36 out of 48, there 36

remayneth 12. S. Now wyl I 12

proue in a greater sūme. And I wyl

subtracte 2367924 out of 3468946,

Those sūmes I sette in order thus.

3468946 Then do I begynne at

2367924 the ryght syde, and de-

ducte 4 out of 6, and

there resteth 2, whiche I wyte vn-

der them. Then go I to the seconde

figures, and withdawe 2 out of 4,

and there remayne 2, whiche I sette

vnder them also: then I take 9 out

of 9, and there resteth 0, whiche I

wyte vnder them, for you say, that yf

the figures be equal, so that nothyng

remayne, I must wyte this cyphar 0

vnder them. M. It was well remem-

bred, now go forth. S. Then come I

to the.iiii. place and dawe 7 out of

8, and there remayneth 1, whiche I

wyte vnder them also: then in the.v.

place



# Subtraction.

place I take 6 from 6, and there re-  
steth nowght, for it I wryte vnder the  
a cyphre 0: then in the. vi. place 3 re-  
bated from 4, remayneth 1, whiche  
I wryte vnder them: and lyke wyse in  
the. vii. and laste place 2 taken from  
3 there is lefte 1, whiche I wryte vn-  
der the: so haue I done my hole wo-  
kyng, and my sūmes appere thus:

3468946	wherby I se, that yf I
<u>2367924</u>	rebate 2367924 oute
1101022	of 3468946, there re-
	mayneth 1101022. M.

This is well done, and that you may  
be sure to perceauue fully the arte of  
subtraction, lette me se howe can you  
subtract 52984732 out of 8250003456  
S. fyrste I sette downe the greatestte  
sūme, and then I wryte vnder it the  
lesser nomber, begynnynge at þe ryght  
syde, and then my figures wyll stande  
thus.

Then take I 2 frō	8250003456
6, and the reste is	<u>52984732</u>
4, whiche I wryte vnder them, then	

do



do I withdꝛawe 3 from 5, and there  
 remaine 2, whiche I wyte vnder  
 them: then take I 7 out of 4, but  
 that can I not, what shall I now do?  
 M. Marke well what I shall tell you  
 now, how you shall do in this case, &  
 in all other lyke. If any figure of the  
 nether summe be greater then the fi-  
 gure of the sūme that is ouer hym, so  
 that it can not be taken out of the fi-  
 gure ouer hym, then must you put 10  
 to the ouer figure, and then consyder  
 how moch it is: and out of that hole  
 summe withdꝛawe the nether figure,  
 and write the reste vnder them. Can  
 you remēbre this? S. yes that I trust  
 I shal. Now then in my exāple where  
 I shulde haue taken 7 out of 4, &  
 coulde not, I put 10 to that 4, which  
 maketh 14, from it I take awaye 7,  
 & there resteth 7 also, which I write  
 vnder them. M. So haue you done  
 well, but now must you marke an o-  
 ther thyng also: that whē so euer you  
 do so put 10 to any figure of the ouer  
 nom=

### Subtraction.

number, you muste adde one styll to the figure or place þ foloweth nexte in the nether lyne, as in this example there foloweth 4, to which you must put 1 and make hym 5, and then go on, as I haue taught you. S. Then shall I saye 4 and 1 (whiche I must put to hym for the 10, that I added to 4 befoze) make 5, whiche I shuld take out of 3, but that can not be, therfoze must I put to it also 10 and then it wyl be 13, fro whiche I take 5, and there resteth 8 to be witten vnder them: and bycause of that 10 added to the 3, I muste adde 1 to 8 that foloweth in the nether lyne, and maketh 9, whiche I shulde take out of 0 and can not, therfoze I put thereto 10 and that maketh 10, from 10 I take 9, and there remayneth 1, which I wyte vnder them. Then do I adde 1 lykwysle to the nexte figure beneth which is 9, and that maketh 10, that 10 shulde I take out of the figure above, but I can not, for it is 0, therfoze



foze I put 10 to it, and so take I 10  
 out of 10, and there restyth 0 to be  
 wrytten vnder them: then come I to  
 the nexte fygure, whiche is 2, and to  
 hym do I adde 1, whiche makyth 3,  
 that 3 I can not take out of nawght,  
 therfoze of that nawght I make 10,  
 and thense do I take 3, so remaynyth  
 there 7 to be wrytten vnder them:  
 lyke wyse do I take 1 to 5 that folo=  
 weth, and then is it 6, that wolde I  
 take out of 5 and can not, therfoze I  
 take 10 to that 5, and make it 15, from  
 whiche I rebate 6, whiche I write  
 vnder them: nowe haue I spent all  
 the nether fygures, and what shall I  
 do moze? M. you shulde haue addyd 1  
 to the nexte fygure folowynge (yf ther  
 had ben any) bycause you addyd 10 to  
 the laste fygure befoze of the ouer  
 lyne. But seynge there is no fygure  
 folowynge, you must adde that 1 to  
 the place folowynge, and then deducte  
 that 1 from the nombze aboue. Scol.  
 Then shall I saye bycause I bozo=  
 I wyd

and fere  
 restyth 9



### Subtraction.

wyd 10 to the ouer 5, I must put 1  
in the nexte place beneth, that is vn-  
der 2, then must I subtrakte that 1  
from 2, and there restyth 1 to be writ-  
ten vnder that 2 in the 9 place: nowe  
I haue no more to subtract, for there  
is neuer a fygure remaynyng beneth  
nother yet any vnpte to be added, by-  
cause I borrowed not 10 to the figure  
last before, and yet is there 8 remay-  
nyng in the ouer lyne, whiche (I  
thynke by reason) shulde be set at the  
ende of þ figures in the lowest rowe,  
whiche is vnder the lyne, forbycause  
there was nothyng taken from it. M.  
That is well considered, and reason  
teacheth so in dede: how be it (as I  
sayde before) I wyl omytte the rea-  
sons tyll another more conueniente  
tyme, and wyl onely at this tyme tea-  
che you the practyse of the arte, that  
you may exercyse your selfe sumwhat  
in it, in the meane tyme, by proper &  
wytty questiōs, as I wyl teache you  
some, before we departe. And when  
you

you haue well occupied your mynde  
and quykened your witte in it, then  
wyl I afterwarde at your returne,  
enstructe you in the reasons of all this  
workynge, that then you may worke  
perfectely, when you se the reasons in  
euery thyng, why you shulde so do.  
S. Syr well I maye praye to God to  
recompence this your goodnes: but  
surely I can not do it with any tem-  
porall benefyte, nother any other mā  
in my behalfe: for what treasure is  
there to be compared to the ryches &  
treasure of lernynge? But syr (I be-  
seche you) shall I alwayes when any  
number so remayneth alone (as this  
s dyd) wyte hym vnder the lyne,  
strayght agaynst his owne place? M.  
yea what elles, whether they be one  
or many; and this well remēbred, you  
haue learned subtraction. Now be it,  
bycause of certeyne thynges þ myght  
deceue you, yf you dyd not take good  
hede to your workynge. I wyl pro-  
pose to you an other example of ma-



# Subtraction.

ny nōbers to be subtracted, as thus.  
 I receyued of a frende of myne to  
 kepe 2869 crownes, whiche at one  
 tyme I delpyuered hym agayne 500,  
 at an other tyme 368, and at an other  
 tyme 440, & an other tyme 80, & an  
 other tyme 64. Now wolde I know  
 how many doth rest behynde. Ther-  
 fore fyrst I set downe my grosse sume  
 & vnderneath hym I set all þe parcels,  
 thus. And vnder them a  
 double lyne.

Then fyrste I begynne  
 at the fyrst place, and ga-  
 ther together the sume  
 of all those lynes (saue  
 the ouermoste) in theyr  
 fyrste figures, and so do

I with all the figures of the seconde  
 place, and so forth, as I dyd in addi-  
 tion, saue that I leue out the hyghest  
 rowe of nōbres: and that sume so ga-  
 thered betwene the lynes, do I sub-  
 tract out of the hyghest rowe of nom-  
 bres, and þe remayner do I set vnder  
 the

2869

500

368

440

80

64



# Subtraction.

37

the nethermost lyne, as for example:

I set the sumes as be-  
foze: then do I gather  
the fyrst fygures toge-  
ther, where I fynd but  
4 and 8 that make 12  
(for.iii.ciphers encrease  
no summe in addition,  
as you learned befoze)  
of þ 12 therfore do I

$$\begin{array}{r} 2869 \\ 500 \\ 368 \\ 440 \\ 80 \\ 64 \\ \hline 1452 \\ \hline 1417 \end{array}$$

wryte the dyget 2, & kepe the article in  
my mynde tyll I come to the seconde  
places, where I fynde 6, 8, 4, 6, that  
make 24, to them I put the article  
in my mynde, and it is 25, of whiche  
I wryte 5 vnder the seconde place, &  
kepe the dyget 2 in my mynde for the  
thi. place, where I fynde 4, 3, 5, that  
make 12 to the whiche I adde the 2  
in my mynde, and that maketh 14,  
therof I wryte the 4 vnder the thyrde  
place, and bycause there remayneth  
no more figures to be added, I wryte  
the diget 1 in þ fourth place, as you  
se in the exāple. Then come I to sub-

I.iii.

tra-

## Subtraction

tractynge of this summe, and I shall subtracte the summe betwene the lynnes, from the ouermost sūme, sayeng: 2 from 9 remayne 7, to be wyrtten vnder them, beneth the lowest lyne: then in the seconde place I take 5 from 6, and there resteth 1 to be wyrtten vnder them. Then in the thyrde place, 4 from 8, resteth 4. In the. v. place 1 from 2, remayneth 1. And thus I see that after those 5 sūmes are subtracted from 2, 8, 6, 9, the remayner is 1417. S. This I perceauē, but is there no shorter waye and moze speedier? M. yes, when you are a whyle exercysed in it: for you maye as faste as you can gather the numbers together, withdraue them out of the hyghest sūme: yf so be it, that all the parcels which you do gather do not excede 9; but and yf they excede 9 then must you subtracte only the digette, that is in it, & reserue the article tyll the nexte place, where you shall adde it with the other fygures, and so subtract

tracte þ hole out of the figure aboue  
 them: but & yf in this place the sūme  
 of the parcelles do excede 9, then (as  
 I sayde before) subtracte the digette  
 only, and reserue þ article to the next  
 place, and so styll go forth, tyll you  
 haue ended your workynge: as for ex-  
 ample in the laste summes proposed,  
 I gather fyrst in the fyrste place 4 &  
 8 þ maketh 12, of which I deduct the  
 dygette 2 out of 9, and wryte vnder  
 the remayner, whiche is 7, & the arti-  
 cle 1 I kepe in my mynde. Then in þ  
 seconde places I gather the parcels  
 6, 8, 4, 6, whiche amount to 24, to þ  
 I adde the article 1 (whiche I haue  
 in my mynde) and then is it 25, then  
 do I take 5 (that is þ digette in this  
 nomber) from 6, that is in the second  
 place of the hyghest summe, and there  
 remayneth but 1, to be wrytten vnder  
 them, and now do I kepe the article  
 2 in my mynde styll. Then in þ thyrde  
 place 4, 3, 5, maketh 12, and the ar-  
 ticle 2 in my mynde, maketh 14, then

I.iiii.

take



### Subtraction.

take  $\text{¶}$  4 (whiche is the dyget) from 8, that is ouer them, and there resteth 4, whiche  $\text{¶}$  write vnder them. Then haue  $\text{¶}$  the article 1 yet in my mynde, whiche  $\text{¶}$  shulde adde to the parcels nexte folowynge, but seynge there is no nomber folowynge,  $\text{¶}$  take that dyget alone, and deducte hym out of the nexte summe aboue, whiche is 2, and then is the remainer 1, which  $\text{¶}$  write in the fourth place vnder 2. Nowe haue you a shorter waye. S.  $\text{¶}$  I lyke bothe wayes well, &  $\text{¶}$  perceaue bothe well: yet as in the one, the workinge semeth somewhat longe, so in  $\text{¶}$  other it leueth very much (me semeth) to remembraunce, and therfore maye cause errour quykly, excepte a man haue a quicke and an exercised remembraunce. M. What, wolde you then haue suche a waye, that shulde not be so longe as the one, nor so shorte as the other? S. Yea, yf there were any suche. M. Then do thus: styll as you gather your parcelles when they exceede

cede a dyget, and maketh 10 or more,  
 take the article & write hym betwene  
 ii. lynes (as in the fyrste example) vn-  
 der the nexte place toward the lefte  
 hande, and then deducte the dygette  
 from the figure that is ouer hym, and  
 write the remayner. And then when  
 you gather the nexte parcelles, you  
 shall adde to them the figure that is  
 vnder them, betwene the. ii. lynes: &  
 yf it excede 9, do as I sayde before,  
 write the article vnder the next place  
 betwene the lynes, and subtracte the  
 digette from the figure that is ouer  
 those parcelles: and yf that all þe par-  
 celles together, and the nomber be-  
 twene the lynes do make but a diget,  
 then deducte it holly from the figure  
 aboue: as in this example. I wolde  
 subtracte out of 40308964  
 40308964, these. iii. 20003428  
 parcels 20003428. 10002342  
 10002342. 10101461, 10101461  
 thefore I sette them  
 fyrst in order thus,

$$\begin{array}{r}
 40308964 \\
 20003428 \\
 10002342 \\
 10101461 \\
 \hline
 \end{array}$$

f.v.

and

### Subtraction.

and then I gather the parcels of the  
fyſte place, whiche are 8, 2, 1, that is  
11, of which I take away the article,  
and ſet hym vnder the ſeconde place  
betwene the lynes, and the dyget 1  
remayneth I deducte out of 4, and  
there reſteth 3, to be wryten vnder  
fyſte place benethe the loweſte lyne.  
Then come I to the ſeconde place, &  
gather the parcels of it 6, 4, 2, & the  
1 betwene the lynes whiche make 13,  
of whiche I take the article and ſette  
hym vnder the thyrde place, betwene  
the lynes, and the dyget 3 I wryte vn-  
der the ſecond place benethe  
the loweſt lyne. Then in the thyrde place I fynd  
4, 3, 4, which with the 1 betwene the  
lynes do make 12, therfoze I wryte  
the article agayne vnder the fourth  
place, and the dyget 2 I take from 9  
& there remayneth 7, whiche I wryte  
vnder them, benethe the loweſt lyne.  
And then come I to the. iiii. place,  
where I gather 1, 2, 3, and the 1 be-  
twene 5 lynes, that maketh 7, which  
by=



because it is but a diget I plucke fro  
 8, and the remayner is 1, and must be  
 witten vnder them, in the.iiii.place.  
 Then come I to the. v. place, where  
 are onely. iii. cyphars, whiche make  
 nothyng, then shulde I take that (̄  
 is to saye, nothyng) from the figure  
 ouer them, whiche is also a cyphre,  
 therfore I muste saye thus: yf I take  
 nought from nought, there remay-  
 neth nought, so muste I wryte a cy-  
 pher vnder them. Then in the. vi.  
 place, I fynde but 1, whiche I take  
 out of 3 ouer hym, and the remayner  
 is 2, that must be witten benethe ̄  
 lowest lyne in the. vi. place. So go I  
 to the. vii. place where I fynde onely  
 cyphers, & in ̄ grosse sume ouer them  
 a cypher also, therfore must I wryte  
 theyr remayner (whiche is nothyng)  
 with a cypher also. Then in the. viii.  
 and laste place, I gather 1, 1, 2, that  
 make 4, which yf I take out of ̄ 4  
 that is ouer them, there wyl nothyng  
 remayne, & that must be noted with a  
 cyphre

## Subtraction.

cyphre benethe the lowest lyne: as I haue often sayd. And thus haue I ended my worke, and the figures stande thus.

S. Sy; I remembre, you taught me that cyphers shulde not come in þ last place, for bycause they ser-

$$\begin{array}{r}
 40308964 \\
 20003428 \\
 10002342 \\
 10101461 \\
 \hline
 111 \\
 \hline
 00201733
 \end{array}$$

be onely to encrease the balewe of other figures whiche folowe them, and serue not for those figures that go before them: and now in your example you haue set ii. cyphers in the two laste places.

M. I comende you for your remembrance, and truth it is, I shulde not haue set them here, but only bycause that I wolde make you playnely to perceauie the arte of subtraction, therfore seynge you do nowe perceauie it, when so euer you shulde write downe a cypher, loke whether any other figures be yet behynd, and yf not, then let go þ cypher also, for it nedeth not

to

to write him in any later places, wher  
no other fygure doth folow, except it  
be (as I dyd) to teache the vse of sub=  
traction the playner, therfore my fy=  
gures must stande thus when I haue  
ended my worke.

	40308964
S. So I wolde thynke	20003428
by that you taught me	10002342
before, And nowe I	10101461
thynke I coulde sub= tract any lyke sumys.	<hr/> 111 <hr/> 201733

M. So may you yf you  
haue marked, what I haue taught  
you. But bycause this thyng (as all  
other) must be lerned suerly by often  
practyse, I wyll <sup>propound</sup> ~~propound~~ here. ii. ex=  
amples to you, whiche yf you often  
do practyse, you shal be rype and per=  
fecte to subtracte any other summe  
lyghtly, for in it is contayned all the  
obseruances of hole nombze. And by=  
cause you shal perceaue sumwhat  
bothe howe to do it, and also whether  
it be well done, when you haue pro=  
ued to do it, therfore haue I writen  
vnder

*propound*



# Subtraction.

308964	125614
103145	342
102597	681
101024	201
11	11
2198	124390

Under them bothe they? remayners.  
 S. Sy? I thanke you, but I thynke  
 I myghte the better do it, yf you dyd  
 shewe me the workynge of it. M. Yea  
 but you muste proue your selfe to do  
 some thynges that you were neuer  
 taught, or els you shall not be able to  
 do any more then you were taught, &  
 were rather to learne by rote (as they  
 call it) the by reaso. And agayne there  
 is nothing in this exāple or any other  
 of hole nombꝛe, but I haue taught you  
 the rules of them al ready. S. Then I  
 trust by practyse to attayne & vse of it.  
 And is this al & I shal learne of sub-  
 traction? M. Yea, sayunge that (as  
 you haue sene in Addition) there are  
 broken nombꝛes or fractions, in whi-  
 che the workynge is not moch vnylike,  
 yet

yet wout some instructiōs be geue of  
it, it myght seme to a lerner moze dif-  
fycult thē in dede it is, therfore I wyl  
breyely shewe you þ v̄se of it onely by  
one exāple oʒ. ii. A certayn man owed  
to me 14 li. 12 s. 8 d. of which he payd  
me at one tyme 4. l. 6 s. 8 d. at another  
tyme 3 li. & at another tyme 2 li. 3 s.  
4 d. & laste of all 6 s. 8 d. now wold  
I knowe, what remayneth vnpayde  
yet: Therfore I set my summes thus.

S. Sy? I praye you,	li.	s.	d.
why do you wryte 2. l?	14	12	8
foʒ the cōmon speache	4	6	8
v̄s̄ȳth rather to saye	3		
40 s. M. We muste	2	3	4
here v̄se the denomy-		6	8
nation that is grea-	<hr/>		

teste in any sūme, so that we may not  
wryte, accoʒdyng as we v̄se to speake,  
sayng 16. d. 18. d. oʒ lyke wayes: 7  
grotes 8 grotes 24. s. 40. s. 48. s. &  
soche other, but we must wryte every  
denominatyōn, that is in any summe,  
by it selfe, namely Shyllinges and  
poun-

# Subtraction.

poundes so must we wyte for these  
 summes nowe namyd, 1  $\bar{s}$ . 4.  $\bar{d}$ . 1  $\bar{s}$ .  
 6  $\bar{d}$ . 2  $\bar{s}$ . 4  $\bar{d}$ . 2  $\bar{s}$ . 8  $\bar{d}$ . 1 li. 4  $\bar{s}$ . 2 li.  
 2 li. 8  $\bar{s}$ . and so forth of other lyke. So  
 that we may not wyte in arith=  
 metyke penne, when the summe a=  
 mountyth to thyllinges, nor thyllyn=  
 ges when the summe maketh pou=des  
 Now yf it please you ende your exa=  
 ple.

	li.	$\bar{s}$ .	$\bar{d}$ .
M. When my summes	14	12	8
are so set as I shewyd	4	6	8
then must I begynne	3		
with the smalleste de= nominatyon, saynge	2	3	4
8 4 8 are 20, whiche		6	8
summe bycause it is		1	
penne, and 12 pen= nes do make 1 $\bar{s}$ . I must take from	4	16	

that 20 (whiche comineth of the .iii.  
 parcelles 12, and for them wyte 1 be  
 twene the lynes, vnder  $\bar{s}$  thyllinges:  
 then the 8  $\bar{d}$ . that remayneth, I take  
 out of the bygheste summe (which is  
 also) and then remayneth naught  
 wher=



wherefore vnder the penneſ, I wyte  
nothyng. Then come I to the ſhyll-  
lynges, and gather þ̄ parcelles 6, 3, 6,  
whiche with the 1 betwene the lynes  
make 16, that muſt I take out of the  
ſumme, that is ouer it: but ſeynge þ̄  
ſumme is but 12, I can not take 16  
out of 12, I muſte bozowe 1 of the  
14 li. & put to the 12, & that maketh  
32, for 1 li. is worth 20 ſ. then take  
I 16 out of 32, and there reſteth 16,  
to be wryten vnder the ſhylllynges.

Then come to the poundes, whoſe  
parcelles are 2, 3, 4, that is in all 9,  
and 1 moze muſte I adde therto, by-  
cauſe of the 1 that I bozowed before  
vnto the 12 ſ. and then is there 10  
whiche I muſt take out of 14, ſo doth  
there remayne 4 to be wrytten vnder  
the poundes: ſo dothe my remayner  
appere to be 4 li. 16 ſ. S. This do  
I perceaue very well, and yf there be  
none other thyng to be learned in ſub-  
traction, then maye I come to multy-  
plication, for that you rekened next.

## Subtraction.

M. we haue done n dede w the art of Subtraction, as touchynge the working. But yet befoze we go to Multiplication, I wyll enstruchte you howe to examyn your worke, whether it be well done or no, & that is by castynge awaye 9, as often as you can fynde it (as you dyd in Addytion) sayynge þ you must here examyn the hyghest nombze alone, and note the resydewe of it, at a lynes ende, as you dyd in addition. And when you haue done whith the hyghest nomber, then examyne all the other together, castynge thense 9 as often as you can: and yf the remayner be lyke the other, then haue you done. But yf you haue dyuers denominations in your summe, yet for them all shall you make but one seuerall lyne (as you dyd in Addition) remembrynge to begynne the examination at the greatest denomination, and to double the remayner of poundes, and triple the remayner of Shyllynges, as you dyd also in Addition

# Subtraction.

44

tion. As for a p<sup>ro</sup>ofe, I wyl examyne  
this worke, wherein the  
hyghest lyne I fynd of  
poundes 14, frō thence  
I bate 9, and there re-  
steth 5, whiche I do  
double ( bycause they  
are poundes, and then  
are they 10, therto I

li.	ſ.	ſ.
14	12	8
4	6	8
3		
2	3	4
	6	8
4	16	

adde the 12, and it maketh 22, from  
whiche I take 9 twyse, and there re-  
steth 4, which (bycause they are ſhyll  
lynges) I triple, and then are they 12,  
therto I adde the 8, & then are they  
20, thence take I twyse 9, and yet  
resteth 2, whiche I write at the one  
ende of a lyne, thus. 2—— Then I  
examyn all the other parcelles, and  
remayner together, euery denomina-  
tion by it ſelfe. And fyrſte of poundes  
I fynde 4, 3, 2, 4, that is 13, frome  
whiche I take 9 and there resteth 4,  
that do I double and it maketh 8, to  
it do I put the ſhylllynges 6, 3, 6, 16,  
that is 31, for the 1 betwene the ly-

G.ii. nes



### Subtraction.

nes must not be reckened, no? none in that space) and that maketh in all 39, where hence I take 9 . iiii . tymes, & there remayneth 3, that do I take .iii . tymes and it is 9, wherefoze I caste it away: then do I take the penne 8, 4, 8, that make 20, from whiche I take 9 twyse, & there resteth 2, which I wryte at the other ende of þe pꝛofe lyne, and bycause I se that those .ii . nombꝛes are equall, I saye þe I haue well wꝛought. And yf you wyll, you maye make foꝛ euery denomination a lyne, as you lerned in addition: but then must you begyn your examination at the smalest denomination, as you dyd in Addition, foꝛ theyꝛ pꝛofe is al together lyke, sauynge that in Addition you examyned the nethermost sūme alone, & al the other together, & in Subtraction you must examyne the highest nōber alone, & al the other together. And yf you make it well it is euen all one, foꝛ þe sūme that in Addition is lowest, in subtraction is hyghest, and

# Subtraction.

45

and þe sūme is called þe grosse or totall sūme. Therfore yf you marke what I said in Addition, you may easely perceave, what is to be done for the pꝛofe of subtractiō, & to thentent þe you may perceave it þe better, I wyl shewe you another pꝛofe of Subtractiō, & that shall be by Additiō, thus. Drawe vnder the lowest nōber (which is your remayner) a lyne, then adde þe number, & all þe other, that you dyd subtracte befoze together, & wyte that that amounteth vnder the lowest lyne, & yf þe sūme that cometh therof be equall to the hyghest of the subtractiō, the was þe subtractiō well wrought, els not, as for exāple, in þe last sūmes, which stode thus.

fyyst I adde 8, 4, 8, that maketh 20, wherof I take 12 awaye (bycause they make one shylling) and wyte for them vnder the shyllin=

Grosse or Totall summe.

li.	s.	d.
14	12	8
4	6	8
3		
2	3	4
	6	8
<hr/>		
1	1	
<hr/>		
4	16	
<hr/>		

G.iii.

## Subtraction

ges, and the 8 that is lefte, I write benethe the lowest lyne, then adde I þe myllynages 6, 3, 6, 1, 16, that make 32, from whiche I take 20, and for it I write 1 vnder the poundes, and the 12 that remayneth, I write vnder the myllynages. Then come I to the poundes, addynge them together, whiche are 4, 3, 2, 1, 4, þe maketh 14, the do I write 14 vnder the li, & so haue I ended þe additiō, & I se þe the lowest lyne of nōber & the hyghest be lyke, wherfor I know þe I haue wel done, for my figures appere thus.

And thus now haue I taught you þe arte of Subtractiō, and the meanes to proue, whether it be well wroughte or not.

Now, and you remēber, I omptted in tea

chyng the pzoofe of Additiō, one way, whiche I sayd was by Subtraction. S. Truth it is, and then was it deferred

li.	ſ.	ſ.
14	12	8
4	6	8
3		
2	3	4
	6	8
<hr/>		
1	1	
<hr/>		
4	16	
<hr/>		
14	12	8



red, bycause that I had not then learned the feate of subtraction, wherby I shulde haue proued it, but now (I thanke you) I haue well learned the art of Subtraction, and the proues of it, both by 9, & by Addition, And now I wold be glad to knowe how I may proue Addition by Subtraction. M. Then marke you this: whē yon haue ended your addition, take the nōbers all that you dyd adde to the hygheste summe, and deducte or subtract the frō the grosse sūme þ̄ doth resulte, & yf the remayner be lyke to þ̄ hyghest nōb̄re, then haue you done well, els not: as for exāple, I take one of þ̄ sūmes þ̄ I dyd adde before, whiche was this. Then do I come to the mydle nōber, & subtract þ̄ frō þ̄ nether nōber begynnyng at þ̄ left hand, and fyrst I saye 0 out of 0, there remaineth 0, that write I vnder another lyne. Then agayne 0 (in the seconde place) from 0, remaineth 0,

$$\begin{array}{r}
 106800 \\
 9400 \\
 \hline
 116200
 \end{array}$$

## Subtraction

vnder it I write 0 also. Then in the  
 thynde place, 4 out of 2 wyll not be,  
 therfore I adde to that 2, 10, & make  
 it 12, from that I take 4, and there  
 resteth 8. Then say I farther 9 in 6  
 iiii. place and 1 (which I muste adde  
 for the 10 borrowed before) make 10,  
 that must I take from 6, & bycause  
 I can not, I adde to the 6, 10, and  
 then is it 16, from thence I take 10,  
 and there resteth 6 to be writte vnder  
 them. Then in the .v. place, where I  
 fynde nothyng written, I must set 1  
 for the 10 last borrowed, and that 1 do  
 I take from the 1 vnder hym, and so  
 remayneth naught, wherfore I write  
 downe a cipher 0. Now haue I done  
 with the subtraction, and yet in the  
 grosse summe remayneth 1 whiche I  
 must set ryght in the same place, in 6  
 remayner, and so the re-  
 mayner appereth to be  
 lyke vnto the hygheste  
 summe of the addition,  
 as here appereth.

$$\begin{array}{r}
 106800 \\
 9400 \\
 \hline
 116200 \\
 \hline
 106800
 \end{array}$$

wherfore

wherfoze I saye, that the Addition was wel wrought, and thus may you do in any other summe of one denomination or many. Therfoze now wpll I make an ende of Subtraction, and wpll instructe you in Multiplicatiō.

### **M**ultiplication.



Multiplication is an operation by .ii. summes producyng the thyrde, which so many tymes shall containe the fyrste, as there are vnites in the seconde, And it serueth in the stede of many additions : as for example. Yf I wolde knowe how many are thyrtye tymes 48, yf I shuld adde 48, thyrtye tymes it wolde be a longe worke : therfoze was thys worke of Multiplication deuysed, which shall do that at ones, that Addytion shuld do at many tymes. S. I perceaue the cōmodityte of it partely, but I shall not see the full profyt of it, tyll I knowe the hole vse of

G. b.

it.



## Multiplication.

Multiplicati-  
on of digyts.

It. Therfore fyr, I beseeke you, teach  
me the workynge of it. M. So  
I iudge it best, but bicause that great  
summes can not be multiplid, but  
by the multiplicatiō of dygetes: ther-  
fore I thynke best, to shewe you fyrst  
the arte of multiplyenge them, as  
whē I say, 8 tymes 8, or 8 tymes 9. &c.  
And as for the small dygetes vnder 5  
it were but foly to teache any rule, se-  
ynge they are so easy that euery chylde  
can do it: but for the multiplicatiō  
of the greater dygetes thus shall  
you do. Fyrst set your dygetes one  
ouer the other ryght, then loke howe  
many eche of them lacketh of 10, and  
wryte that agaynst eche of them, and  
that is callyd the dyfferences: as yf  
I wolde knowe how many are 7 ty-  
mes 8, I muste wryte those digettes  
thus.

8

Then do I loke how moche  
8 doth dyffer from 10, and  
I fynde it to be 2, that 2 do I wryte  
at the ryghte hande of 8, thus:

7

Then

The Diffe-  
rence

8 2  
7  
Then do I take þ difference  
of 7, lykewayes from 10, þ  
is 3, and I write that at the  
ryght syde of 7, as you se in this ex=  
ample.

Then do I drawe a lyne vn=  
der them, as in additiō, thus.

Then do I multiply the two dyfferē=  
ces, sayeng: 2 tymes 3 make 6, that  
must I euer set vnder the differences  
beneth the line: thē must I take þ one  
of the differences (which I wyl for all  
is lyke) from the other digette, not  
from his owne, and that þ  
is lefte, muste I write vn=  
der the digettes, as in this  
example.

Yf I take 2 from 7, or 3 from 8, there  
remayneth 5, that 5 must I write vn=  
der the dygettes, & then there appe=  
ryth the multiplycatiō of 7 tymes 8,  
to be 56. And so lyke of any other dy=  
gettes, yf they be aboue 5, for yf they  
be vnder 5, then wyl they? dyfferen=  
ces be greater then them selfe, so that  
they

## Multiplication.

they can not be taken out of them, & agayne suche lytle summes euerpe chylde can multiplie, as to say, 2 tymes 3, or 4 tymes 5, & suche lyke. S. Truthe it is, and seynge, me semeth, that I vnderstand the multiplyenge of þe greater dygettes, I wyl proue by an exāple how I can do it: I wold knowe howe many are 9 tymes 6. M. It is al one in valewe to say 9 tymes 6, or 6 tymes 9, but yet the order is beste to put the lesser summe fyrste, sayenge, 6 tymes 9, & so of all other summes. S. then wolde I know how many are 6 tymes 9, therfoze I set the dygettes, thus.

Then do I set ther dyfferences at theyr ryghte syde, the dyfference of 9, which is one agaynst it, & the difference of 6 whiche is 4 agaynst it also, as in this example.

9	1	And vnder them I drawe a lyne, then do I multiply the dygettes together, sayenge i tyme 4 maketh 4, that 4 do I wyte vnder
6	4	
<hr style="width: 100px; margin: 0;"/>		



## Multiplication. 49

Under the differences thus.

Then take I one of the dyf-  
ferences from the other dy-  
get, as 1 from 6, or els 4 frō

9 1

6 4

5 4

9, and eche wayes there resteth 5, whi-

che I do wyte vnder the dygettes,

and so apperyth the multiplicatiō of

6 tymes 9 to be 54. Thus I see the

feate of thys maner of multiplycatiō

of dygettes. M. Nowe mought you

go strayght to the multiplicatiō of

greater nōbers, saue y both for your

ease & suertye in workynge, I wyll

draue you here a table, wherby shall

appere the multiplicatiō of all dy-

gettes, & this is it.

**A** table to multiply all  
dygettes by.

# Multiplication

1	1	2	3	4	5	6	7	8	9
2	4	6	8	10	12	14	16	18	
3	9	12	15	18	21	24	27		
4	16	20	24	28	32	36			
5	25	30	35	40	45				
6	36	42	48	54					
7	49	56	63						
8	64	72							
9	81								

In whiche figure when you wolde knowe any multiplicatiō of digettes, seke your fyrste or laste digette, in the blacke squares, and from it go ryght forth towarde the ryghte hande, tyll you come vnder the figure of your seconde diget, whiche is in the hyghest rowe, and then the nomber that is in the metynge of theyr bothe squares, is the multiplicacion that amoūteth of them. As yf you wolde knowe by this table the multiplicatiō of 7 tymes 9, seke fyrst 7 in the blacke squares, and then go ryghte forth toward the

the ryght hande, tyll you come vnder  
9 of the hyghest rowe, and in the me-  
tynge of they? squares, you may se 63  
whiche is they? multiplicacion. S.

Thys is very good and redde, and so  
may I fynde the multiplicacion of  
any digettes. But nowe how shall I  
do in greater sumes? M. When you

wolde multiply any summe by an o-  
ther, you shall marke, that it is the

To Multiplie  
greater sumes

metest order to set the greatest nom-  
ber hyghest, which is the place of the  
number that must be multiplyed :

As lyke wayes the lesser nōber vnder is  
for that is the place of the multiplier

Multiplier

or multiplicatour, that is to saye the  
number, by whiche multiplicacion

is made, and is in Englyshe all ways  
put befoze this worde, tymes, in soch

Tymes

speakyng, when I say, 20 tymes 70,  
and the number that foloweth this

worde, tymes, is that whiche must be  
multiplyed. Therfoze when I wolde

multiplie one number by an other, I  
must write the greatest hyghest, and

the



## Multiplication.

the lesser vnder it, as in additiō. And vnder them muste I drawe a lyne, as for exāple. Vt I wold multiply 264,

by 29, I must set them thus. 264

Then must I multiply euery 29

figure of the hygher rowe, by

euery fygure of the nether rowe, and

that that amountyth I must sette vn-

der the lyne, as thus: fyrst I do mul-

typlye 4 by 9, sayenge 9 tymes 4 (or

4 tymes 9 which is all one) and that

makyth 36, as the table befoze of dy-

gettes doth declare, of that 36 I must

wryte the 6 that is the dyget vnder

the 9, and the 3 in the nexte place to-

warde the lefte hande.

Then come I to the seconde 264

figure of the hygher rowe & 29

say, 9 tymes 6, make 54, of 36

which I wryte the 4 vnder

the 3, and the 5 vnder the next place

(as reason wylleth me) thus. 264

Then come I to the nexte fi- 29

gure which is 2, and do mul- 536

tiply it by 9, & that maketh 4

# Multiplication.

51

is, wherof I write 8 vnder the thyrde place, and the article 1, in the fourth place, thus.

2 6 4

And then haue I ended the

2 9

fyfste figure of the multy-

1 5 3 6

plyer. Then begyn I with

8 4

the nexte figure, and multi

plye it into all the hygher fygures,

as thus.

2 6 4

Fyft 2 tymes 4, make 8,

2 9

that do I write vnder the se-

1 5 3 6

conde place (for euer more þ

8 4

diget, or fyft figure of þ mul

8

tiplication þ amoūteth of the fyft fi-

gure of the hygher nōber, must be set

vnder the multipler of it, & the other

in theyr orðre toward the lefte hand.

S. I vnderstande you thus, that the

digette of the summe amountynge of

the multiplicacion of the fyft figure

of the hygher rowe, by the fyft figure

of the lower rowe or multipler, must

be set vnder the fyfte place: and that

amounteth of the same fyfte figure,

by the seconde multipler, must be set

þ

vnder

## Multiplication.

Under the seconde place: and so of the other, yf there be moze multyplyers.

M. So meane I in dede: and yf there amount but a dygete, then must it be sette vnder the same. And now to go forth, I multiplie by the same 2, the seconde fygure of the hygher rowe, which is 6, sayeng 2 tymes 6, make 12, where of I wryte the dyget 2 vnder the thyrde place, and the artycle 1 I wryte vnder the fourth place.

Then do I multiplie the laste fygure of the hygher summe, by that same 2, sayenge, 2 tymes 2 is 4, whiche I wryte vnder the fourth place, and so haue

I endyd the hole multiplicatiō, and the summes stande thus.

Then must I drawe a lyne vnder all those sūmes that amount of multiplicatiō, & must adde all them into one summe, as in this example you maye see, where in the fyrst place

I



# Multiplication.

52

I fynde but 6, and ther-  
foze write I it vnder the  
lyne: then in the seconde  
place 8, 4, 3, make 15 wher  
of I write 5, and kepe 1 in  
my mynde, and so forth,  
as you lerned in Additiō

$$\begin{array}{r} 264 \\ 29 \\ \hline 1536 \\ 184 \\ \hline 428 \\ \hline 7656 \end{array}$$

and so apperyth the hole summe to be  
7 6 5 6, which amountyth of the mul-  
typlycation of 2 6 4 by 29. S. Xf ther  
be no moze to be obseruyd in it, then  
can I do it, I suppose, as by this ex-  
ample I shal proue: I wold multiply  
1365 by 236, wherfoze I set the thus.

Then do I multiply 5 by

$$\begin{array}{r} 1365 \\ 236 \\ \hline \end{array}$$

6, sayeng 6 tymes 5 make

30, of whiche I write the

cypher in the fyrst place, & the article  
3 in the seconde place.

$$\begin{array}{r} 1365 \\ 236 \\ \hline \end{array}$$

Then do I by the same 6

$$\begin{array}{r} 236 \\ 30 \\ \hline \end{array}$$

multiplie the seconde fy-

$$30$$

gure of the higher sūme,

which is 6, sayenge, 6 tymes 6 make

36, of which I wryte the 6 vnder the

seconde place, and the 3 vnder the

H.ii.

thyrde

# Multiplication.

thyrde place.

Then do I multiply the  
thyrde figure which is 3  
by the same 6, & that ma-  
keth 18, of that I set 8

vnder the thyrde place, and the 1 in the  
fourthe place.

Then come I to the laste  
fygure of þ hygher sūme,  
and multiply it by 6, say-  
enge, 6 tymes 1 make 6,

that do I write vnder þ fourth place.

And so haue I ended the fyrst  
multiplier: then begynne I  
with the seconde multiplier,  
and say fyrst, 3 tymes 5 that  
maketh 15, of which I set the

5 vnder þ seconde place (bycause that  
the multiplier is there) and the 1 I  
set vnder the thyrde place.

Then come I to the secōd  
figure that is 6, and mul-  
typlye it by 3, whiche ma-  
keth 18, of which I set 8  
vnder the thyrde place,

$$\begin{array}{r} 1365 \\ 236 \\ \hline 330 \\ 6 \end{array}$$

$$\begin{array}{r} 1365 \\ 236 \\ \hline 1330 \\ 86 \end{array}$$

$$\begin{array}{r} 1365 \\ 236 \\ \hline 1330 \\ 686 \end{array}$$

$$\begin{array}{r} 1365 \\ 236 \\ \hline 1330 \\ 686 \\ 15 \end{array}$$

and

# Multiplication.

53

and the article 1, in the fourth place.

1 3 6 5 Then come I to the thyrde  
2 3 6 figure which is 3, and mul=  
1 3 3 0 tiply it by 3, sayeng, 3 tymes  
6 8 6 3, make 9, which bycause it  
1 1 5 is but one dygette, I set vn=  
8 der the fourth place. 1 3 6 5

And then cōpyng to the last 2 3 6  
figure 1, I multiply it by 3, 1 3 3 0  
and it maketh 3, which I set 6 8 6  
in the fifte place, & then haue 1 1 5  
I ended. ii. of the multiply= 9 8  
ers, and the summes stande thus.

1 3 6 5 Then come I to the thyrde  
2 3 6 multiplier, and multiply it  
1 3 3 0 into euery figure of the hy=  
6 8 6 gher summe, and fyrst I saye  
1 1 5 2 tymes 5 make 10, of which  
3 9 8 I set the cypher vnder þ mul=  
typlyer, in the thyrde place,

and the article 1, in the fourth place.

And so multiplyenge the seconde fy=  
gure 6, by that same 2, there amoū=  
teth 12, wherof I write the dyget 2, 3 9 8  
vnder the fourth place, and the arti= 1 0

H.iii.

cle



# Multiplication.

cle 1 vnder the fyrste place.

Now do I multiply by the

same 2, the thyrde figure

of the hygher sūme, whiche

is 3, and that maketh 6,

whiche I set vnder y fyste

place. Then come I to the

laste place, and multiplye

that 1 by 2, and there a

mounteth 2, whiche I set in the syxt

place, & the doth y sūmes stand thus.

And so haue I ended the

hole multiplicatiō. But

now (as you taught me)

to knowe what this hole

sūme is, I must adde all

those parcels together,

and then vnder the lyne

wyll appere the grosse or

total sūme, y is 322140.

M. That is well done. S. Then me

thynketh I wolde call it well done,

when I knewe whether I had well

done or no. M. It may be tryed by 9

as Addition was, but the surest profe

is

$$\begin{array}{r}
 1365 \\
 236 \\
 \hline
 1330 \\
 686 \\
 115 \\
 398 \\
 110 \\
 62 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1365 \\
 236 \\
 \hline
 1330 \\
 686 \\
 115 \\
 398 \\
 110 \\
 2 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 1365 \\
 236 \\
 \hline
 1330 \\
 686 \\
 115 \\
 398 \\
 110 \\
 262 \\
 \hline
 \end{array}$$

is by **D**yuyſion, and therfore I wyl  
reſerue that, tyll you haue learned  
tharte of **D**iuyſion. And befoze we  
paſſe from **M**ultiplicatiō, I wyl yet  
ſhewe you other wayes of it, whiche  
are counted of ſome men both moze  
reddye, & moze certayne, of which the  
one dyfferyth nothyng from this þ  
I haue taught you, ſayenge that it  
doth vnderſtāde all wayes the arty-  
cles, and ioynē them to the next kīme:  
& therfore I wyl declare it onely by  
and exāple: **N**e I wold multiply 1542  
by 365, I muſt ſet them as I ſayde  
befoze, and then do I multiply 2 by 5  
and it maketh 10, of whiche I wyte  
the article vnder the fyrſte place, and  
kepe the dygitte 1 in my mynde.

1542    Then ſay I forth, 5 tymes 4  
365    do make 20, and þ one in my  
0    mynde are 21, therof I write  
the 1 vnder the ſeconde place,  
& kepe the 2 in my mynde.

Then come I to the thyrde  
fygure 5, ſayeng, 5 tymes 5,

H.iiii.

1542

365

10

make



## Multiplication.

make 25, and the 2 in my mynde,  
make 27, wherof I write the 7 vnder  
the thyrde place, and kepe the article  
2 in my mynde.

1542

Then comynge to the last  
fygure I say 5 tymes 1 make

365

710

5, and 2 in my mynd make 7,

that do I write vnder the fourthe  
place.

1542

And then haue I ended my  
fyfste multiplier. Then do

365

7710

I lyke ways with the secod

multiplier, sayenge, 6 tymes 2 make  
12, therof I write the dygete 2 vnder  
the seconde place, and kepe the article  
1 in my mynde.

1542

Then saye I forth, 6 tymes

365

4 maketh 24, and the 1 in my

7710

mynde make 25, so I set that

2

5 vnder the thyrde place, and

kepe the 2 in my mynde.

1542

Then multiply I forth say-

365

enge, 6 tymes 5 makyth 30, &

7710

2 in my mynd make 32, wher

52

of I write the 2 vnder the

fourth



fourth place, & kepe the 3 in my mind.

1 5 4 2 Then do I multiplye the  
3 6 5 laste fygure 1 by 6, and it ma  
7 7 1 0 kethe 6, to that I adde the 3  
2 5 2 in my mynde, and it maketh  
9, whiche I write in the fyrst

place.

And so haue I ended. ii. fy-

gures of þ multiplier, The

with the thirde and last mul

typler do I lyke wayes, &

saye fyrst, 3 tynes 2 make 6, whiche

I write in the thyrde place vnder the

multiplier.

Then by that 3 do I mul-

tiply lyke wayes the second

figure 4, and it maketh 12

wherof I write the digette

2 vnder the fourth place,

and the article 1 I kepe in my mynde.

1 5 4 2

3 6 5

7 7 1 0

9 2 5 2

2 6

Then come I to the thyrde

figure 5, sayeng: 3 tynes

5, maketh 15, and the 1 in

my mynde make 16, therof

I write the 6 vnder þ fyfte

H. v.

place,

# Multiplication.

place, and kepe the artycle 1 in my mynde.

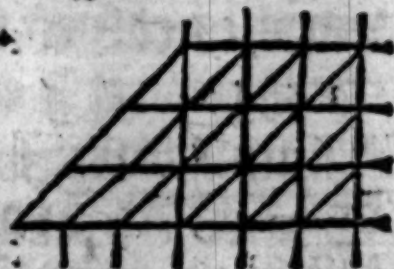
Then come I to the laste figure, whiche is 1, and multiplie it by 3, and it maketh 3, therto I adde the 1 in my mynde, and it maketh 4, whiche I write in the sixte place. And then haue I ended the multiplicatiō, & the figures stande in orde, thus:

$$\begin{array}{r} 1542 \\ 365 \\ \hline 7710 \\ 9252 \\ 4626 \end{array}$$

whiche parcelles yf I adde into one summe, it wyll be 562830, whiche is y<sup>e</sup> grosse or total summe of all that multiplicatiō. S. Well, this ma-

ner of multiplication I perceaue: but what other sort haue you? M. There is one way that is wrought by a checker table, made thus.

And loke how many places your summe hath, that you wold multiplie, so many squares must you make in your table



To Multiplie  
by a checker  
table.

from

from the right syde to the leste, and so many frome the hygher parte to the lower, as there be places in your multiplier. The set downe your greatest summe fyrst on the toppe of the table, every figure (in Dewe orde) i a square alone, I meane in those squares, that be open and vncrossed. And lyke- wayes in those lyke squares, at the ryght hande set downe your multipli- cator, the laste figure in the hyghest place, & so downward, that the fyrste figure maye be in the lowest place. S. Syr, yf it please you, me thinketh the I vnderstande you beste, when you do not stande longe in tellyng y rule befoze examples, but propose some ex- ample, & then in declaryng it, brynge in the rules with all. M. In dede that waye is easiest for a yonge learner, therfoze wyl I euen so do. Take this example now: I wold multiply 2036 by 23. Fyrst I consyder that my grea- test number hath.iiii. fygures or pla- ces, and therfoze I make so many

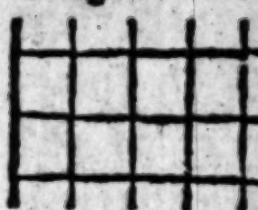
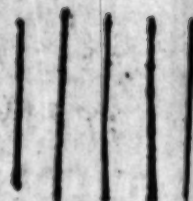
rouines



# Multiplication.

roumes betwene lynnes, thus.

Then I see that of my multipliers there are, ii. wherefore I drawe so many lynnes a crosse the other, that there may be 2 roumes betwene the, thus.



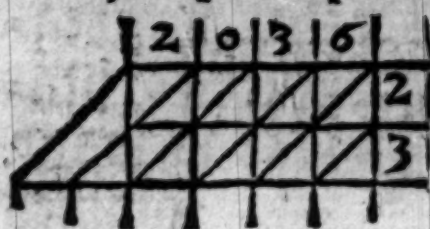
But you muste not forget to let the endes of the lynnes runne out (as it appereth in this patrone) for

in those open squares must your. ii. fyrst numbers, and all the totall sūme be set, Then drawe a crosse barre thorough every close square, so that it may reche down to the lowest ouerthwarte lyne, as in this fourme.



And the is your checker fourme prepared then set downe your

fyrste or greateste sūme on the toppe, and your multiplier on y<sup>e</sup> ryght syde in the open squares, thus.



Then begynne to multiply the first fygure of the hy-

gher

# Multiplication.

57

gher summe by the hygheste of the multiplier, sayenge: 2 tymes 6 make 12, that 12 must you write in that square that is agaynst the 2 and the 6, but of suche maner that the dygitte be set in the nether corner of þ square, and the article in the hyghester corner, as you may se in this example.

1	2	0	3	6

And so of every o-  
ther multiplication,  
what ever amoūteth  
you must write in the

commen square, whiche is agaynst  
bothe those fygures, by which you do  
multiplie, and yf that sūme do make  
but one dygette, then must it be set in  
the lower corner of the square, but yf  
it make an article, then write the arti-  
cle in the hyghester corner, and lette the  
cypher go (yf you wyll euermore) for  
here it serueth for nothyng, sayenge  
the lynes do dystinct the places, but  
yf the summe amountynge of soche  
multiplication, do make a myrte nō-  
ber, then wypte þ article in the higher  
corner

### Multiplication.

corner, and the dygete in the lower  
corner, as I dyd by that 12, then whē  
you haue multiplied and ended the  
fyrst fygure, come to the nexte, and  
multiplie it in lyke maner: as in say-  
enge, 2 tymes 3 is 6, that 6 bycause  
it is but a dygete, you shall set in the  
nether corner of the square, nexte vn-  
der 3, as here foloweth.

Then go forth say:  
enge, 2 tynges o is o,  
set that vnder the  
batte(yf you lyst) in

the thynde square.

Then forth, & saye, 2 ty-  
mes 2 make 4, that sette  
in the last square vnder

2	0	3	6
4	0	6	2
			3

the barre, so haue you ended the fyrst  
multiplier: come therfore to y second  
and say, 3 tymes 6 make 18, of whiche  
summe the article 1 must be set aboue  
the barre, in that square that is next  
to the 3 (as you se here) and the the 8

bn=



2	0	3	6
4	0	6	2
		1	8

Under the barre.  
Then saye, 3 tymes 3  
maketh 9, sette it in the  
nexte square beneth the

barre, then 3 tymes 0 is 0, wryte it in  
p next square 0; let it go, for al is one.  
S. I perceaue, for here the lynes dy-  
stinct the placys wherfore ciphers do  
only serue, & therfore here they nede  
not to be. M. then say farther, 3 tymes  
2 make 6, wryte that in the last square  
then wll the hole fygyre stand thus  
as here foloweth

2	0	3	6
4	0	6	2
6	0	0	8

S. Nowe coulde I (me  
semeth) do lyke agayne:  
but how shall I do now

to gether the sūme: M. Marke fyrst  
the ordre of the places in this fygyre,  
and so shall you perceaue the reason  
of getherynge them into a sūme. The  
slope barres do parte the places, so  
that the fyrst place is the loweste cor-  
ner (in all suche fygyres) of the ne-  
thermost square, next the ryght hand  
and all the halfe squares betwene p  
barre

## Multiplication.

barre, and the nexte standeth for the seconde place, and so the roune betwene that and the nexte barre is the thyrde place, and so forth. Now yf you perceaue this, then must you adde all the fygures of one place to gether, as yf you had an addityon of dyuers summes. S. Yf I vnderstande you ryght, then must I take here in this exāple s to be in the fyrst place, 9, 1, & 2, in the seconde. 0, 6, 1, in y<sup>e</sup> thyrde. 6, 0, in the fourthe, 4 in the fyfte, and the syxte place hath no figure. M. you say wel, & the reason is bycause the multiplication seruyng to that square, made but a dygette. S. Then it is all one, as if they stode thus,

	12
M. eyn so it is, and nowe	061
adde this summe, & there	46098
wyll appere the totall of y <sup>e</sup>	

multiplication to be 46828. And yf you wyll se the agremente of this maner of multiplication, and the other that you lernyd befoze: then multiply those two sunmys (that is 2036 by



# Multiplication.

59

23) after þe fyrst maner without squares. S. You meane to set them thus in order.

2036

And then multiply 3 into 6,

23

make 18, 3 tymes 3 make 9,

3 tymes 0 is 0, then 3 tymes 2 make 6,

which must be set thus.

2036

Then do I lyke ways with þe

23

seconde multipliyer, sayenge,

18

2 tymes 6 make 12, 2 tymes

609

3 make 6, 2 tymes 0 is 0, and

2 tymes 2 make 4, whiche when I

adde to the other, then wylle the hole

multiplication stande thus.

2036

M. So that you may se in

23

euery place the same figures

18

here, as they were in the mul

609

tiplication by squares,

12

though they differ in heygth

406

& lownes of places, but being addyd

to gether they make one summe. And

thus now ye haue lerned .iii. sortes of

multiplicatiō, which you liketh best þe

may you vse. Yet are there other for

mes, but syth they nothing differ frō

A.

these



## Multiplication

these thre in effecte, but onely in settinge of the nōbers, I wyl ouerpasse thē tyll a moze meter place and tyme, And nowe wyl I enstruct you in Division, so that you thynke your selfe sufficiently to perceave, what I haue taught you. S. Yes sy? I thanke you, but I do not pceave how to examyne my worke, to trye whether I haue well done or no. M. That is cōmenly vsed by the pꝛofe of 9, as you learned before in Addition, and Subtraction, saue that it hath this wayes dyuers from them. sy?ste you muste make a crosse after this maner.

Then must you examyn your summe that shulde be multiplyed, and loke what remayneth after castynge awaye of 9, that set you at the one syde of the crosse, then examyne the multiplyer, & what so euer remayneth in it after castynge awaye 9, as often as you can, write that at the other syde of the crosse: then must you multiply those, ii. nombꝛes together



ther, and loke what amoūteth therof,  
yf it be vnder 9, wryte it at the hygher  
parte of the crosse: but yf it be aboue  
9, then take thence 9, as often as you  
can, and wryte the reste at the head of  
the crosse, as in þ last example of mul-  
tiplication: the number to be multy-  
plied is 2036, wherein is ones 9, and  
2 remayneth, whiche I wryte at one  
syde of a crosse, thus.

Then do I examyne the mul-  
typlier, whiche is 23, wherein  
there is no 9, but 5 in all, þ 5 there-  
fore I sette at the other syde of the  
crosse, thus.

Then do I multiply 5 by 2, 5  
and it maketh 10, from which  
I withdraue 9, and there resteth 1,  
that 1 do I set at þ head of the crosse,  
then do I examyne the grosse summe  
amountynge of the multiplicacion,  
whiche is 46828 wherein I fynde 9  
thre tymes, and 1 remaynyng, that  
1 I set at the foote of the crosse: and  
then I se it to agree with the other 1

H.ii.

at



## Multiplication

these thre in effecte, but onely in settinge of the nōbers, I wyl ouerpasse thē tyll a moze meter place and tyme, And nowe wyl I enstruct you in Division, so that you thynke your selfe sufficiently to perceave, what I haue taught you. S. Yes sy? I thanke you, but I do not pceave how to examyne my worke, to trye whether I haue well done or no. M. That is cōmenly vsed by the pofe of 9, as you learned befoze in Addition, and Subtractiō, saue that it hath this wayes dyuers from them. sy?ste you muste make a crosse after this maner.

Then must you examyn your summe that shulde be multiplyed, and loke what remayneth after castynge awaye of 9, that set you at the one syde of the crosse, then examyne the multiplyer, & what so euer remayneth in it after castynge awaye 9, as often as you can, write that at the other syde of the crosse: then must you multiply those, ii. nombres together





ther, and loke what amoūteth therof, yf it be vnder 9, wryte it at the hygher parte of the crosse: but yf it be aboue 9, then take thence 9, as often as you can, and wryte the reste at the head of the crosse, as in y last example of multiplication: the number to be multiplied is 2036, wherein is ones 9, and 2 remaineth, whiche I wryte at one syde of a crosse, thus.

Then do I examyne the multiplier, whiche is 23, wherein there is no 9, but 5 in all, y 5 therefore I sette at the other syde of the crosse, thus.

$$\begin{array}{r} \times 2 \\ 23 \end{array}$$

Then do I multiply 5 by 2, 5  $\times$  2 and it maketh 10, from which I withdrawe 9, and there resteth 1, that 1 do I set at y head of the crosse, then do I examyne the grosse summe amountynge of the multiplication, whiche is 46828 wherein I fynde 9 thye tymes, and 1 remainynge, that 1 I set at the foote of the crosse: and then I se it to agree with the other 1

H.ii.

at

## Multiplication

at the toppe of the crosse, and so know  
I that I haue done well: for yf they  
two dyd dyffer, then were my worke  
vayne, and the multiplication false.  
This is the comen p<sup>ro</sup>fe, but the most  
certayne p<sup>ro</sup>fe is by Diuisiō, of whi-  
che I wyll anone enstruete you. S.  
Q<sup>ue</sup>stion, what is the chiefe vse of Multi-  
plication: A. The vse of it is greater  
then you can yet vnderstand, how be  
it these playne commodities it hath,  
that yf you wolde resolue any greate  
and hole valeure into many small &  
lesse portiōs: as yf you wolde chaūge  
poundes into Shyllynges, pennies or  
any other greater or smaller parcels,  
by Multiplicatiō you shall do it spe-  
dely & easely. Also yf you shulde nede  
to adde one summe to it selfe, or any  
other oftē tymes, you shall do it moch  
more spedely, reddely, easely, and su-  
rely, then by often and sundry Addi-  
tiōs: Take you these cōmodities gros-  
sely shewed for an answer at this ty-  
me, & hereafter I wyll more abūdan-  
tly



ly make you to perceave þ̄ vse of it. S.  
 Well syz, then in Diuisiō I pray you  
 to enstruct me. But me thynketh by þ̄  
 name of it þ̄ it shold be al one w̄ Mul-  
 tiplycatyō: for I call that Dyuisiōn,  
 when any thyng is parted into dy-  
 uers and many partes. M. You take  
 it, as it is taken commonly, how be it  
 yf you marke well you shall perceave  
 that it is quyte cōtrary to Mutiply-  
 cation, and doth not part one thyng  
 oꝛ fewe thynges into many, but con-  
 trary wayes it byngeth many par-  
 cels into fewe, but yet so, that these  
 fewe takyn together are equal in va-  
 lure to þ̄ other many, for by Diuysiō,  
 pennies are turned into shylllynges,  
 & shylllyngs into poudes: as for exam-  
 ple, of 120. s. it maketh 6. li. so are  
 120 turned into 6 which is a smaller  
 number, but then yf you consyde the  
 denomyntours, you shall se that  
 they are soche, that one of the later is  
 equall to 20 of the fyrst, and so in val-  
 lewe the summes are one, though in

I.iii.

nom-



## Multiplication.

number they do farre dyffer, and the later summe is the lesser, and so is it al wayes in Diuision, how be it yet in the working, the summe is parted by an other, & therof doth it take þ name S. I thynke I shall better vnderstand the reason of the name, whē I knowe the vse of the worke, therfore nowe wolde I gladly learne that. Ma.

## Diuision.



Diuision is a pttitiō of a greater sūme by a lesser, therfore as you may perceauē, vnto Diuision are requyred. ii. nōbers, the fyrst, which shuld be diuided, & that must be þ greater, and the second, by which þ other must be diuided, & that is the lesser, & is called the diuisor. The fyrst must fyrst be writtē, & the secōd so set vnder it, þ the last figure of þ lower nōber be right vnder the last of þ hygher, cōtrary wayes to the worke of þ other kindes of Arithmetyke, for in them the two fyrst fygyres were set euer mete one vnder the other

other but in Diuision þ last fygures must be set mete, except it chaunce so that the laste fygure of the Dyuisor be greater then the last of the hygher nomber, for then you shall set the last of the Dyuisour, vnder the last saue one of þ hygher nôber, as for exāple, yf you shuld diuide 365 (which are þ sūme of þ dayes of a yere) by 28 (whiche are the daies of a cōmen moneth) then shulde you set them thus. 365

But yf you wold diuide those 28 365 dayes, by 52 (which is þ nôber of wekes in one yere, then shuld you set them thus. Lyke wayes yf I 365 wold diuide the same 365, by 52 4, which is the sūme of þ quarters of a yere, then must I set thē thus. 365

S. Syþ this do I vnderstand, 4 but how now shulde I do to diuide the one by the other? M. You muste begynne with the laste figure nexte þ leste hande, and se how many tymes the laste figure of the Diuisor may be taken out of þ laste figure of the ouer

h.iiii. nom-



## Diuision.

number, that shall you note within a croked lyne toward your right hand, as for example: I wold diuide 365 by 28, then set I those two sūmes, thus.

365 And I loke how many tymes

28 I may fynde 2 (whiche is the

last figure of the diuisor) in 3,

(whiche is the last of the nōber to be

diuided) and consideryng that I can

take 2 out of 3 but ones, I make a

croked lyne at the ryght hande of the

nombres, and within it I sette 1, and

Quotient  
Nombre.

that is called the quotient nombze:

then bycause that whē 2 is taken out

of 3, there remayneth 1, I must write

that one ouer 3, and deface or cancel

the 3 and the 2, then wyl the figu-

res stande thus.

Then must I go to the

nextte figure of the di-

uisor, and take it lyke

wayes so many tymes out of the fi-

gures that be ouer it, and loke what

doth remayne, that must I write ouer

them, and cancell them, as in this ex-

ample

$$\begin{array}{r} 1 \\ 28 \overline{) 365} \end{array}$$



ample: I take ones 8 out of 16, and there remayneth 8, whiche I muste set ouer the 6, & cancell oʒ crosse out the 16 and the 8 of the diuifour. And then wyl the figures stand thus. And so haue I ones wrought

x 8

S. So I perceauē that you take 8 nether figure not onely out of 8 other

8 6 5

2 8

that is ryght ouer hym, but out of 8 with 8 other also that remayneth before, and are wʒiten towarde the lefte hande. M. So must you do, for you must so take the diuifor out of the ouer number, that there remayne not ouer it so great a summe as it is: for then were your worke in bayne. But yet agayn here must you marke, that when you seke howe many tymes the laste figure of the diuifour maye be founde in the number ouer hym, that you loke also whether you maye as often fynde all the figures folowynge in those that are aboue them, yf not, take your qnotiente lesse by one, and

I.v.

then

## Diuision.

then proue agayne, and so styll, tyll  
you fynde a mete quociet. When you  
haue thus wrought ones, then must  
you begynne agayne, and wryte your  
dyuysor a newe nerer towarde the  
ryght hande by one place, as in this  
example, you shall set 2 vnder 8 and  
8 vnder 5 thus.

	x 8	(
Then as befoze seke	3 6 5	
how many tymes you	2 8 8	
may take the last dy-	2	

uysor out of the nombze ouer hym. S.  
That maye I do here 4 tymes. M.  
Truthe it is, that you maye fynde 2  
foure tymes in 8, but then marke  
whether you can fynde the fygure fo-  
lowyng so manye tymes in the other  
that is ouer hym. Can you fynd 8 thir-  
tymes in 5? S. No nother yet ons. M.  
Therfoze take 2 out of 8 ones. lesse.  
S. That is 3 tymes. M. Well then 3  
tymes 2 make 6: yf I take 6 out of 8  
there remayneth 2, which 2 with the 5  
folowyng make 25 in whiche summe  
I maye fynde 8 thze tymes also, and  
therfoze

therfoze I take 3 as a true quotyent,  
and wryte it within the crokyd lyne  
of the quotyent befoze the 1 thus.

Then say I 3 tymes 2  $\times 8$   
make 6, then 6 out of 8  $3 \ 6 \ 5$   
resteth 2, therfoze I  $\times 8 \ 8$  (13  
cancell the 2, and the 8  
and wryte ouer it the 2 that doth re=  
mayne thus.  $2$

Then do I take 8 as  $\times 8$   
many tymes out of 25  $3 \ 6 \ 5$   
sayeng 3 tymes 8 make  $\times 8 \ 8$  (13  
24, & yf I take 24 out  
of 25 there remayneth 1, so then I can  
cell 2 5 & 8, and ouer the 5 I set 1 thus.

$\times$  And now haue I done  
 $\times 8 \ 1$  with dyuidynge: for I  
 $3 \ 6 \ 4$  (13 can fynde my dyuyfor  
 $\times 8 \ 8$  28 no moze in the ouer  
 $\times$  summe. S. No, excepte

you wolde parte the 1 that remayneth  
into 28 partes. M. That is well sayd,  
and so must we do in suche cases whe  
there remayneth any thyng, but I  
wyl lette that passe nowe, and wyl  
make



## Diuisiō.

make you perfecte in hole Diuisiōn,  
and wyl here after teache you pecu-  
lyarly of broken nombze callyd frac-  
tions. And now yf you do perceauē  
the order of dyuisiōn, then do you dy-  
uide this summe 136280 by 452. S.  
fyyste I set downe the number that  
shulde be dyuided, then do I set the  
dyuisor vnder it, so that the laste fy-  
gure of it, be ryght vnder the laste fy-  
gure of the ouer number. Then wyl  
it be thus. M.

1 3 6 2 8 0

Can you take the last of 4 5 2  
your dyuisor (whiche is 4) out of  
which is the last of the ouer number?  
S. I had forgotten, bycause the laste  
of the dyuisor can not be taken out of  
the last of the ouer nōber, in as moche  
as it is the greater, therfore must I  
sette the dyuisor one place moze for-  
ward towarde the ryght hande, thus.  
And then muste I loke

1 3 6 2 8 0

how often I may fynde

4 5 2

the last fygure of the dyuisor (that is  
4) in 13, whiche thynge I may do 3 ty-

mes

mes, therfoze do I say, 3 tymes 4 is 12,  
which I take out of 13 & there remay-  
neth 1, then do I make at the ryght  
hand of my sumes a croked lyne, and  
write befoze it my quotyente 3, and I  
cancell 13 and 4, and ouer the 3 I sette  
the 1 that remayneth, and then the fi-  
gures stande thus.

Then do I multiply  
the same quotient in-  
to euery figure of the

$$\begin{array}{r} 1 \\ \times 36280 \\ \hline 452 \end{array} \quad (3$$

diuisor, and withdraue the summe &  
amounteth, out of the nombres ouer  
them: as fyrste I say, 3 tymes 5 make  
15, which I take from 16, and there re-  
steth 1, I cancell therfoze 16 and 5, &  
write ouer the 6 that 1 that remay-  
neth, thus.

11

Then do I say lyke  
wayes, 3 tymes 2  
make 6, whiche I take out of 12, and  
there resteth 6, therfoze I cancell the  
12 and the 2, and ouer

$$\begin{array}{r} 11 \\ \times 36280 \\ \hline 452 \end{array} \quad (3$$

the 2 I write 6 that  
remayneth, thus.

$$\begin{array}{r} 11 \\ \times 36280 \\ \hline 452 \end{array} \quad (3$$

Then



# Diuision.

Then shulde I set forward the diuisor into the next place toward the right hande thus.

M. But you may see  $\overline{) 136289}$  (3  
ouer  $\overline{) 4}$  is no figure,  $452$   
therfore must you set

the diuisor yet forwarder by an other place. And marke whē so euer it chaūcheth so, that you shulde set forward the diuisor, and that it can not stande there, bycause there is no nōber ouer the last place, or yf there be any, it is lesser then the last figure of the diuisor, then must you remoue the diuisor yet ones agayne: and bycause  $\overline{) 136289}$  his fyrste place of remouyng sayled hym, therfore shall you write in the quotient a cyphre 0, & yf you shulde by chaūce nede to do so often tymes, for euery tyme write a cyphre in the quotient, The reason of this wyl I shewe you hereafter. S. Then must I set my summes thus.

And bycause I re-

moued



moued the diuisor, so þæt I ouerskyp=  
ped one place, I must write a cyphre  
in the quotient: and then must I seke  
a newe quotient, as in this example:  
How many tymes 4 is there in 6, and  
syth it can be but ones, therfore do I  
write 1 in the quotient, & then say I, 1  
tymes 4 taken out of 6 remaineth 2,  
I cancell the 6 and the 4, and wryte  
2 ouer thē. Then say I agayne, ones  
5 out of 28 remaineth 23, I let the 2  
stande as it dyd, and ouer the 8 I set  
3, cācelling þæt 8 & the 5 vnder it thus.

M. You myght as

wel haue sayd ones

5 out of 8 and so re=  
mayneth 3: but now

go forth. S. Then  
ones 2 out of 0, can not be, what shal  
I nowe do? M. Borrowe of the nexte  
number that is behynde (for there is  
230) and do as you learned in Sub=  
traction in a lyke case. S. Then must  
I borrowe 1 of the 3 cōmyng behynd  
nexte, and make that 0 to be 10, and  
then

$$\begin{array}{r}
 2 \\
 4 \overline{) 280} \\
 \underline{4} \phantom{0} \\
 230 \\
 \underline{46} \\
 280 \\
 \underline{462} \\
 280 \\
 \underline{462} \\
 280 \\
 \underline{462} \\
 280
 \end{array}
 \quad (301$$

## Division.

then take  $\text{I}$  2 out of 10, and there re-  
steth 8: and bycause  $\text{I}$  borrowed 1 of  
the 3,  $\text{I}$  must cancell the 3, and write  
2 ouer it, then doth the figure stand  
thus.

M. Now haue you  
done, and yet remay  
neth 2 2 8, and your  
quotiēt doth shewe  
you that yf you di-

uide 136280 by 452, you shall fynde  
your diuisor in your greater number  
301, that is CCC. tymes and ones, &  
228 remaynyng. And in the other ex-  
ample where  $\text{I}$  diuided 365 by 28, the  
quotient was 13, & 1 remayned, wher-  
by  $\text{I}$  knowe that in a yere (which con-  
tayneth 365 dayes) there are 13 mo-  
nethes, reckenyng 28 dayes (or 4 we-  
kes) iust to a moneth, and 1 day moze.  
S. Why then do we call a yere but 12  
monethes? M. Of that at a moze con-  
uenient tyme wyl  $\text{I}$  fully enstructe  
you, but now it is not conuenient to  
entangle your mynde w other thyn-  
ges



gys the do dyrectly pertayne to your  
 mater, therfore yf you can remembze  
 what you haue hard, you haue lerned  
 a shorte maner of dyuision, whiche I  
 wolde haue you often to practyse, so  
 that you may be perfecte in it, and  
 hereafter I wyl shewe you certayne  
 other proper poyntes touchyng it. S.  
 Then I pray you yet tell me how shal  
 I examyne and trye my worke, whe-  
 ther I haue done well or no, that  
 though no man be by me to tell me,  
 yet I may perceaue it my selfe. M.  
 Summe men (yea and comenly) do trye  
 that, by the rule of 9 as in all the o-  
 ther kyndes, saue that there order is  
 this. fyrst they cast away 9 as often  
 as they can out of y diuisor, and that  
 that remayneth they sette at the one  
 syde of a crosse, as in our fyrste exāple  
 the diuisour was 28 from which you  
 maye take 9 ones, and 1 remayneth,  
 which they set by a crosse thus.

Then do they lyke wyse examy-  
 ne the quotient (whiche in our

✱

example



## Diuision

example is 13) and from thence they cast away 9 as often as they can, and the remayner they set at the other syde of the crosse, and then multiplye they to gether those 2 remayners, and to it that amounteth, they adde the remayner of the diuisiō, yf there were any, from that hole summe they with- drawe 9 as often as they can, and the rest they set at the hed of the crosse, as in our exāple, the quotiēt is 13 whiche maketh onely 4, & therfore muste you set 4 at the other syde of y<sup>e</sup> crosse thus.

Then multiply 4 by 1 and it yeldeth but 4, therto adde the remayner of the diuisiō (whiche was 1) and it wylbe 5, whiche summe doth not amoūt to 9, and therfore must be set holely at the hedde of the crosse, as you see here.

And this nōber on the head of the crosse is the fyrst pzoſe to whiche yf you fynde a nother lyke in the nomber that was diuided, then haue you done well. Therfore nowe

Hall

$$\begin{array}{r} 4 \times 1 \\ \hline \end{array}$$

$$\begin{array}{r} 5 \\ 4 \times 1 \\ \hline \end{array}$$

Shall you lykewyse examyne the hole summe that was diuided, and take away 9 as often as you can, and that that remayneth, set at the fote of the crosse, and yf it be equall to that in þ head of the crosse, then haue you well done, els not, as in our example the hole summe was 365 whiche maketh 14, from that take 9 & there resteth 5, which set at þ fote of the crosse thus.

And you shall see, that they agre, therfore haue you done well. S. Nowe wyll I lyke

$$\begin{array}{r} 5 \\ 5 \overline{) 5} 1 \\ 5 \end{array}$$

wyse examyne our seconde example, where the diuiseur was 452 whiche maketh 11, from thence I take 9 and þ 2 that remayneth, I set at the ryght syde of a crosse thus.

Then examyne I the quotiēt which was 301, where I fynd

$$\begin{array}{r} \times 2 \end{array}$$

but only 4 that do I set at the other syde of the crosse thus.

Then do I multiply 4 by 2

$$\begin{array}{r} 4 \times 2 \end{array}$$

and it maketh 8, to that do I adde the remayner of the diuision,

8.ii. (whi-

## Diuision

( whiche was 228 and maketh 12 )  
 and they two make 20, wherein I  
 fynde twyse 9 and 2 remaynyng, that  
 2 must I set at þ hed of the crosse thus  
 Then do I examyne the hole  
 nomber to be diuided, whiche  
 was 136280 where I fynde  
 twyse 9 and 2 remaynyng, whiche I  
 set at þ fote of the crosse, thus.  
 And bycause that it doth agre  
 with the figure at the head of  
 the crosse, I knowe that the diuision  
 was well wrought. M. This is the  
 cōmen pꝛofe, howe be it, the moze cer-  
 tayne woꝝkyng is by the contrarpe  
 kynde, as to pꝛoue Diuision by Mul-  
 tiplication, thus. Multiply the quo-  
 tient by the Diuisor, and yf the sūme  
 that amounteth be equall to the sūme  
 that shuld be deuided, then haue you  
 well deuyded, els not. How be it, this  
 must you marke, þ yf there remayned  
 any thyng after the diuision, þ must  
 you adde to the sūme that amoūteth  
 of the multiplication: as in our fyꝛste  
 example



example the quotient was 13, and the diuisor was 28. Now multiplie the one by the other, and the summe wyl be 364, to that yf you adde the 1 that remayned after the diuision, then wyl it be 365, whiche was the sūme that shuld be diuided, & therfore I knowe that I haue well done. S. Now wyl I proue the same in the second example, whose diuisor was 452, and the quotient 301: these do I multiply together, and there amounteth 136052, to whiche yf I adde the 228 that remayned, then wyl it be 136280 which was the hole summe to be deuided, & therfore I perceaue that I haue well done. M. This is the sureste waye to examyne Diuisiō, by Multiplicatiō, and contrary wayes, the surest profe of Multiplication, is Diuision. And therfore now wyl I shewe, how you may proue Multiplication by Diuision. When you haue ended Multiplicattion, and wolde knowe whether you haue well done or not: set y grosse

## Diuision.

summe that amounteth of the multiplication, ouermoste, and diuide it by the multiplier, and yf the quotient be the same number that shulde be multiplied, then haue you well wrought, els not, as in that example, where we multiplied 264, by 29: & grosse sūme was 7656. Now yf you wyll knowe, whether that multiplicatiō be trewe, you shall deuide that 7656, by the multiplier 29. And you shall perceaue, that the quotient wyll be 264, and that is a token, that you haue well wrought. S. By your pacyence I wyl proue that, and fyrste I sette downe the grosse sūme, and the multiplier, not after the rule of Multiplication, but after the rule of Diuisiō, for now that number is become the diuisor, that was before the multiplier, I shal set them therfore thus.

	7656
And then shall I seke how	29
many tymes 2 in 7, that maye be 3 ty	
mes and 1 remayneth, but then maye	
not 9 be founde so often in 16, ther-	
	fore

foze must I take a lesser quotiēt, that is to saye 2, then saye I twyse 2 maketh 4, whiche I take out of 7, and there remayneth 3, then do I cancell 7 and 2, and ouer 7 I write 3, and in the quotient I sette 2, so the figures stande thus.

Then say I forth, 2 ty-  
mes 9 make 18, whiche

$$\begin{array}{r} 3 \\ 7656 \\ 29 \end{array} \quad (2$$

I bate out of 36, and there resteth 18, then cancell I 3, and ouer hyin set 1, and lyke wayes I cancell 6 and 9, & ouer them I set 8, so that thus stande the figures.

Then do I set forwarde  
the diuisor by one place,  
and seke a newe quotiēt,

$$\begin{array}{r} 1 \\ 38 \\ 7656 \\ 29 \end{array} \quad (2$$

that is to say, how many tymes 2 are in 18, whiche I fynde to be 9 tymes, but then can I not fynde 9 so many tymes in 5, therfore I take a lesser quotient, as to say 8, but yet is that to greate, for yf I take 8 tymes 2 out of 18, there remayneth but 2, and I can not fynde 8 tymes 9 in 25, ther-

k.iiii. foze



# Diuision.

foze yet I take a lesser quotient, that is 7, whiche is also to greate, foze yet I take 7 tymes 2 out of 18, there resteth 4, but now I can not take 7 tymes 9 out of 45, therfoze yet I seke a lesser quotient, as to say, 6, then say I 6 tymes 2 make 12, that I take out of 18, and there remayneth 6, so I cancell that 18 and the 2, and write 6 ouer 8, then say I forth 6 tymes 9 maketh 54, that take I out of 65, & there remayneth 11, and the figures stande thus.

Then must I set forth the diuisor agayne, & then seke a newe quotient, which wyl be 4, foze though I maye fynde 2 in 11 fyue tymes and one re-

mayne, yet I can not fynde 9 so often in 16, therfoze I sette the figures thus.

And 4 in 4 quotient I multiply into the figures

$$\begin{array}{r}
 1 \\
 26 \\
 381 \\
 7646 \quad (26 \\
 2999 \\
 22
 \end{array}$$

figures of the diuisor, sayenge, 4 tymes 2 maketh 8, whiche I take out of 11 and there resteth 3, therfore I cancell the 11 and the 2, and set 3 ouer þe fyrst place of 11, thus.  $\times$

And then do I say forth  $\times 63$

4 tymes 9 maketh 36,  $38 \times$

whiche I take from 36,  $7656 \left( 264 \right.$

and there remayneth  $2999$

nothyng, so þe quotient of this diuision, where 7656 is

diuided by 29, is 264, whiche dothe

declare that yf 264 be multiplied by

29, the sūme wyll be 7656. And thus

I perceauē nowe how bothe Multi-

plycation is proued by Diuisiō, and

Diuision also by Multipliycatiō. M.

Now haue I ended the. v. moſte cō-

men kyndes of Arithmetike: for as

touchynge Mediation, Duplation,

Triplation, and such other, they are

no seuerall kyndes of Arithmetike,

but are cōtayned vnder the other, for

Mediation is conteyned vnder Di-

uision, and is nothyng els but deu-

k. v. dyngē

## Diuision.

dyng by 2, and so are Duplation, and  
 Cryplation contayned vnder Multy  
 plication, for Duplation is nothynge  
 els but multiplyeng by 2, and crypla  
 tion is multiplyeng by 3, of whiche I  
 wyll only propose examples, for the  
 rules you haue heard all redye, yf you  
 wolde medyate, or diuide into 2 this  
 summe 4531010, you shall set 2 for the  
 diuisor, and worke as you lerned be  
 fore, as thus.

4531010

Then I fynde 2 in 2

4 two tymes, therfore

my quotyent must be 2, so I cancell  
 4 and 2, and remoue the diuisor for  
 warde thus.

4531010

The agayne I fynde 2

2 in 5 twyse, & 1 remaynynge,

so I wyte 2 agayne for my se  
 cond number of the quotyent, and  
 cancel 5 and 2, and ouer 5 I set 1 thus.

Then remoue I the

1

dyuisor forwarde,

4531010

and seke a newe quo

22

tyent, whiche is 6 then say I 6 tymes

2 make



2 make 12 take that out of 13, and ther  
resteth 1, so I cancel 2 and 13, and ouer  
3 I sette 1, thus.

Then remoue I the  $\begin{array}{r} 4531010 \\ 222 \end{array}$  (226  
diuisor forwarde, &

seke a newe quotient which is 5, then  
take I twyse 5 out of 11, and there  
restethe 1, so I cancell the 2 & the last  
fygure of 11 & let the fyrt stand thus.

Then remoue I the  $\begin{array}{r} 4531010 \\ 2222 \end{array}$  (2265  
diuisor forwarde &

seke a newe quotyēt  
whiche is 5 then take I 2 fyue tymes  
out of 10 and there resteth nothyng,  
then remoue I agayne the diuisor  
forwarde thus.

But bycause I  $\begin{array}{r} 4531010 \\ 222222 \end{array}$  (22655  
can not fynde the

diuisor in the nomber ouer it, I must  
set a cypher in the quotyent, & remoue  
the diuisor to the nexte place thus.

Then seke I a  $\begin{array}{r} 4531010 \\ 2222222 \end{array}$  (226550  
newe quotyent

whiche I fynd  
to be 5, for so many tymes may I haue

2 in

## Diuisiō.

2 in 10. The haue I fully ended this Mediatio, or Diuisiō by 2, and the quotient is this 2265505, whiche is the halfe of 4531010, as you may trye by Duplation: for double that quotient, or multiply it by 2, and the same nōber wyll amoūt. But I wyll no longer tary about these, seynge they are but membes of the other kyndes.

Cofz fourmes

But here nowe wyll I teache you certayne easy formes bothe of Multipli-  
cation and of Diuisiō, and fyrste of  
Multiplikation. If you wolde ther-  
fore multiplie any summe by 10, you  
shal nede to do no moze but adde a ci-  
pher befoze his fyrst place: as for ex-  
ample, 36 multiply by 10, make 360.  
Lyke wayes yf you wyll multiplie  
any summe by 100, put two ciphers  
at his begynnynge. So yf you wolde  
multiply any sūme by 1000, adde thre  
ciphers to the begynnynge of it. S.  
This do I wel perceaue, and also the  
reason of it. M. I wyll onypte all rea-  
sons tyll our nexte metynge, when I  
shall

Shall tell you the reasons of all other partes of Arithmetike also: and as to our mater now, loke (as I haue tolde you) that you do bothe remembre it, and also often pꝛactise it. But yf you wolde multiply any nōber by 5, marke fyrste whether the nomber be euen or odde, and yf it be euen, take the halfe of it, and wꝛite a cypher at the begynnyng of it, as foꝛ example: I wolde multiply 2564 by 5, I take the halfe of it, which is 1282 (as you may know by Mediatton) and befoꝛe it I sette a cypher thus, 12820, and this is 5 tymes 2564. And thus may you do with any other euen sūme, that you wolde multiply by 5. But yf the summe be odde, as foꝛ example: 2563, then must you take the lesser half of it, or (if you wyl) take awaye 1 from the fyrste figure (as here from 3) and then take the halfe of the reste, and set befoꝛe it 5, as of 2563, the lesser halfe is 1281, foꝛ here I take but 1 foꝛ the halfe of 3, and yf I putte 5 befoꝛe that lesser halfe



### Diuision.

halfe, then haue I multiplied it 5 tymes, as thus, 12815. S. What meane you by the lesser halfe? M. There is no iuste halfe of any odde nōber, therfore yf we diuylde an odde nomber into two partes as nygh equall as can be, yet wyll the one halfe exceade the other halfe by one, as for example: The two most nerest halves of 9, are 5 and 4, and lykewayes of 15, are 7 & 8, where you se, that the one parte wyll is greater then the other by one. Now it is easy to knowe which is the greater halfe, & which the lesser halfe. S. Then I perceauē you, and can do lyke wayes I doubt not w any sūme: for yf it be not very easy to parte into halfe, then wyll I do it by Mediatio easely ynoughe. M. That is a sure way. And now haue you learned how to multiply easely by 5, 10, 100, 1000, and of lyke maye you do with any other of y sorte. But nowē yf you wyll multiply by 20, 30, 40, and so forth: or by 200, 300, and suche lyke, where  
there

there is one cypher in the fyrst place,  
or many orderly in the fyrste places,  
you shall take awaye those cyphers  
and multiplie the summe only by the  
other figure, or figures (yf they be  
many) and then at the begynnyng of  
the sūme that amoūteth shall you set  
so many cyphers as you toke awaye.  
Example of 2873, which I wolde mul-  
tiply by 300. Fyrste I caste awaye þ  
two ciphers from the multipliyer, and  
I multiply the sūme by onely 3, that  
is lefte, and it amounteth to 8619, be-  
fore whiche I put the two cyphers, þ  
I toke awaye before, and then is it  
861900. And that is the sūme that a-  
mounteth, when 2873 is multiplied  
by 300. S. And yf there were two or  
more figures besyde the cyphers, I  
must onely take awaye the cyphers,  
and multiply by the other figures, as  
I learned before, as yf I wolde mul-  
tiply 93648 by 25000, I shulde take  
awaye the thre cyphers, & multiply þ  
same by 25, & then at þ begynnyng of  
that

### Diuision.

that totall summe shulde I adde the  
thre cyphers agayne. M. Euen so, but  
and yf it chaunce the nōber that shulde  
be multiplied, or bothe the summes,  
as well the number that shuld be mul-  
tiplied, as the multiplier, to haue cy-  
phers in theyr fyrst places, euermore  
cast away the cyphers, and worke by  
the reste: but remembze to restore as  
many cyphers to the amoūtyng sūme  
as you bated befoze, as in this exam-  
ple: 30200 shal be multiplied by 206,  
I shall onely take awaye the two cy-  
phers from the greater nombze, and  
then multiply 302 by 206, and after  
warde adde the two cyphers agayne.  
But yf I wolde multiplie the same  
30200 by 2060, I shall not only take  
awaye the two cyphers from the nō-  
ber that shulde be multiplied, but al-  
so I may take awaye the one cypher  
from the multiplier, and then must  
I adde 3 cyphers to the summe that  
amounteth, but take hede that you  
take away no cypher that commeth  
after



after any sygnypenge fygure, as in this last exsample, you may not take away that in  $\text{p.iiii.}$  place of  $\text{p}$  hygher number, nother that in the.  $\text{iii.}$  place of the multipler, how be it yet this you may do, yf one cypher or moze come in the myddes of your summes you may multiply by the other figures, and ouerskyp them, but so, that you geue euery figure his dewe place as thus,  $\text{I}$  wyl multiplye  $3026$  by  $2004$ , therfoze  $\text{I}$  set them thus.

$3026$  And thus  $\text{I}$  multiply them,  
 $2004$  fyrst 4 tymes 6 make 24  $\text{I}$   


---

 $24$  set the 4 vnder  $\text{p}$  fyrst place  
 $1208$  and kepe the 2 in my mynd,  
 or wyte it downe for easye remembraunce, then say  $\text{I}$  agayne 4 tymes 2 maketh 8, and 4 tymes 0 maketh 0, then 4 tymes 3 maketh 12, but now when  $\text{I}$  come to the nexte cypher bycause that it multiplieth nothyng,  $\text{I}$  let it go, and lyke wayes the second cypher, but then when  $\text{I}$  do come to the 2, and multiply it into the 6 of the

$\text{L.}$  ouer

## D i u i s i o n

ouer number I must take hede (acco-  
rdyng as I taught you in Multipli-  
cation) that the fyrst number amoun-  
tynge of the Multiplication, be set  
vnder the multiplier ryght, and the  
other orderly toward the lefte hād, ac-  
cordyng as you may se in this exāple.

Where yf you had expres-  
sed the cyphers, after the  
comen rate, then shuld the  
fygures stande thus.

3026	But in effecte	3026
2004	al is one, saue	2004
		24
		1208
		12
		604

that the fyrst waye by o-  
uerscyppe of the cy-  
phers is the shorter and  
easier waye, for that in  
effecte they be bothe one  
the Addition of the par-  
cells wyl declare, which in both wyl  
appere thus, 6064104, and now  
wyl I make an ende of this mater. S.  
Syr I thanke you, for I se greate  
ease in this wayes of Multiplication  
and if you can shewe me suche lyke in

D i u i s i o n

Diuision, you shall greatly further me. M. Yes I will teache you summe easie wayes in Diuision also, & fyrste this, yf you wolde deuide any summe by 10 you shall only with your penne make a square lyne betwene the fyrste fygure of your summe, and the second and then haue you done, for the hole number that foloweth that lyne, standeth for the quotyent, and the fygure that is befoze the lyne is the remayner, as for example 3648, diuided by 10 will stand thus.

364 | 8

Where 364 is the quotyent, and betokeneth that so many tymes are 10 in 3648 and the 8 after y lyne is the remayner, whiche can not be diuided into 10 but by breakynge it into fractions wherewith I will not medle yet, and so lyke wayes yf you wold deuide any summe by 100, with your penne you shall cut away the 2 fyrst fygures and yf you wold deuyde by 1000, you must cut away the 3 first fygures & so of any other diuiso: whose last figure



## Diuision

is 1 and y other be cyphers, loke how many cyphers the deuysoz hath, and so maney fygures at the begynnynge shall you cut away with the squyer lyne, and they stande all wayes for the remayner, bycause they are lesse then the deuysoz, and can not be deuided by it, and the other fygures that be behynd the lyne stand for the quoytiente: But now yf your deuysor haue any other fygure in his laste place then 1 and in al his other places haue cyphers, loke howe manye cyphers there be, cutte awaye so many of the fyrst fygures of y nombze that shulde be deuyded, and deuyde the reste that foloweth y lyne, by that fygure that is in the laste place, as yf it were the hole deuysoz: example of 64284 whiche I wolde deuyde by 300, here must I cutte away the 2 fyrste fygures (for so many cyphers my diuysour hath) and must diuide the reste by 3, whiche is the figure in the laste place of the diuysor. Fyrst therfore I parte  
away

a waye the two fyrst figures, and the  
 same standeth thus, 642|84. Then  
 do I diuide 642 by 3, and the quotient  
 is (214, for in 6 I fynde twyle 3, and  
 in 4 ones, and 1 remaynyng, which  
 1 with the 2 next before doth make 12,  
 wherin I fynde 3 foure tymes, and  
 this is a redde waye to turne Shyl-  
 linges into poundes: for syth 1 pou-  
 d doth cōtaine 20 Shyllinges, I muste  
 diuide the hole nombze of Shyllinges  
 by 20, therfore easely to do it, I se þ  
 my diuisor hath 1 cypher, and ther-  
 fore I cut awaye one figure from the  
 begynnyng of the hole summe of Shyl-  
 linges, and then I do mediate or di-  
 uide by 2 the other figures or summe  
 that foloweth. S. I wyll put an exam-  
 ple: If I wolde diuide 64287 s. by  
 20, that is to say, yf I wolde turne so  
 many Shyllinges into poudes, I must  
 cut awaye the fyrste figure, that is 7,  
 and diuide the reste, that is 6428 by  
 2, so shall the quotient be (3214, wher-  
 by I knowe, þ 64287 s. make 3214 li,  
 . L.iii. and

### Diuisiō.

and 7 s. remaynyng. M. Now proue  
by multiplicatiō whether you haue  
well done or no. S. The quotient is  
3214 whiche I do multiply by the di-  
uisor 2, and it doth amounte to 6428.  
M. Hereby may you pceave not onely  
that you haue well done, but also  
how by diuisiō you may tūre shyl-  
lynges easely into poundes. And con-  
trary wayes, by Multiplicatiō you  
maye turne poundes into shyllynges.  
But here shall you se amōgest diuers  
men diuers fourmes of such diuisiō,  
but yf you marke what I haue tolde  
you, you shall pceave easely all theyr  
wayes: for some men do not cut away  
so many of the fyrst figures, of the sūme  
that they wolde diuide, as there are  
cyphers in the fyrste places of theyr  
diuisor, but they set all theyr cyphers  
orderly vnder the fyrste places of the  
number that they wolde diuide, and  
then with the other figure (or figures  
yf they be many) they diuide the reste  
of theyr sūme. Example. Yf they wold  
diuide



diuide 725931 by 3400, they set they<sup>r</sup>  
sumes thus.

725931

And then do they diuide 34 00  
orderly tyll they come to the cyphers,  
for there they stay & ende they<sup>r</sup> worke:  
as in this example: They seke howe  
often 3 maye be founde in 7, whiche  
is 2 tymes, and 1 remaynyng, ther-  
fore they set 2 in the quotient, and ca-  
cell 3 and 7, and ouer 7 they set that  
1  $\bar{p}$  remayned, thus.

725931

(2

Thenne do they go forth sayenge, 2 ty-  
mes 4 maketh 8 whiche they take out  
of 12, and there remayneth 4, thus.

+ 4

Then renewe they the diuisor forward,  
and seke how often 3  
may be found in 4, which is but ones  
and 1 remayneth, then set they 1 in  $\bar{p}$   
quotient, and cancell 3 and 4, & ouer  
them they sette that 1 thus.

725931

(2

34 00

L.iii.

Then

# Diuision.

1  
 24  
 725931  
 344 00  
 3

(21

Thē take they ones  
 4 out of 15, & there  
 resteth 11 : or elles  
 moze easely, take ones  
 4 out of 5, and

there resteth 1, so they cancell the 4  
 and 5, and set 1 ouer them, thus.

Then set they forthe

the diuisor agayne, &

seke howe many ty-

mes 3 are in 11, whi-

che they fynde 3 ty-

mes, and 2 remaynyng, so they sette

3 in the quotient, and cancell 11 and

3, and ouer them setteth 2 thus.

Then do they multi

ply 4 by 3, whiche

maketh 12, that with

draw they out of 29,

and there resteth 17,

of which the 7 must

be set ouer the 9, &

the 1 ouer 2, thus.

And now are the 2 ci

phers nexte ensew-

x

x41

725931

344 00

3

x2

x4x

725931

3444 00

33

1

x2

x4x7

725931

3444 00

33

(21

(213

(213

ynge, so that the deuysoz can no moze  
 be set foꝝward, and therfoze is the de-  
 uision ended, & the remayner is 1731  
 Now the quotient, which is 213, doth  
 declare, that yf you deuyde 725931  
 by 3400, you shall fynd it therein 213  
 tymes, and there remayneth 1731, so  
 shall you fynde it, yf you worke as I  
 taught you, by cuttyng away the 2  
 fyrst figures, bycause of the 2 ciphers  
 but this muste you marke (as you  
 may perceauē by this laste example)  
 that yf there be lefte any other remay-  
 ner in the summe that was behynde  
 the sūpre lyne, that remayner must  
 be sette to the later ende of the fyrste  
 remayner, whiche was cut away with  
 the sūpre lyne, as yf you wolde de-  
 uide 725931 by 3400, after the  
 forme that I taught  
 you, the wolde your  
 sūmes appere thus.

$$\begin{array}{r}
 725931 \\
 3400 \overline{) 725931} \\
 \underline{6800} \phantom{00} \\
 45931 \\
 \underline{3400} \phantom{00} \\
 11931 \\
 \underline{10200} \phantom{00} \\
 1731
 \end{array}$$

So that 17 whiche  
 remayneth after the  
 lyne must be sette to

L.b.

the



## Diuision.

the 31 (that was cutte awaye with the lyne) in hygher places, as you see here, where that 17 with  $\text{p} 31$  do make 1731. And here wolde I make an ende of Diuision, sauyng that there commeth to my mynde one late inuention of easy Diuision, which I wyll bryefely set forth to you, so that yf you fynde ease in it, you may vse it. By cause that the hardest poynt in diuision is the reddye and easye fyndyng of the quotient nombze, and agayne yf that be truely knowen, all the reste is but lyghte to be done, therfore this wayes shall you quykely and truely fynde the quotient. fyrst wyte the figures of nomber, I meane 1 2 3 4 5 6 7 8 9 not a longe as I haue set them nowe, but vp & downe, as in this fourme.

And at the lefte syde of the drawe a longe lyne, as you se here: then consydze the diuisor by whiche you entred to worke, and set it on the lefte syde of the longe lyne

ryght

ryghte agaynst 1, and for a dystinctiō  
drawe a lyne vnder it, then multiplye  
your diuisor orderly by eche of those  
fygures begynnynge with 2, and so  
go downewarde tyll you haue ended  
all, and loke what doth amounte of  
the multiplicatiō of eche figure into þ  
dyuisor, that do you wyte agaynste  
the fygure wherby you dyd multiply.  
S. By example I may perseauue it bet-  
ter. M. Take this example, 2 6 3 8 4 5  
by 64, then must I sette the 9 figures  
as I sayde before, & the diuisor muste  
I set agaynst þ1, with a lyne drawen  
vnder thus.

64 | 1

Then must I multiply that  
diuisor by eche figure order-  
ly: fyrst by 2, and it maketh  
128, whiche I muste sette a-  
gaynst 2 at the lefte hande.

Then multiply I 64 by 3,  
and it maketh 192, which I  
set agaynst 3. The 4 tymes  
64 make 256, that set I by

4. Then say I 5 tymes 64 make 320,  
that

2

3

4

5

6

7

8

9

# Diuision.

that set I agaynst 5. Then 6 tymes 64 make 384, that set I agaynst 6. Then 7 tymes 64 make 448, which I set agaynst 7. Forther I say, 8 tymes 64 make 512, whiche I set by 8. And last of al I say, 9 tymes 64 make 576, which I set agaynst 9. And then they wyl stande thus.

And so is the table ended, by whiche you maye easely fynde the quotient, as you shall se by example now.

Do you set downe the nōbers (as you lerned before) accordyng to the order of Diuisiō. S. That is thus.

263845 M. Now loke

64

what nōber standeth ouer the diuisor, reckenyng therto all them that be behynde it, towarde the lefte hande. S. Then are there ouer the diuisor 263. M. That is iust. Now seke in the table, on the lefte syde, whether you can fynde 263. S. It is not there. M. Then take that nōber, 2 is next to

it be=

64	1
128	2
192	3
256	4
320	5
384	6
448	7
512	8
576	9



it, benethe it: I meane a lesser nom-  
ber the 263, but of all the lesser nom-  
bers that þ table hath, take you that,  
that goeth nyghest to 263. S. That is  
256. M. So is it, & marke this euer  
moze, when you can not fynde iustely  
in the table, that summe that is ouer  
your diuisor, then note that, that is  
nexte benethe it, of any summe that is  
in the table & loke at the ryghte hand  
of the lyne, what figure or diget is a-  
gaynst that summe, and take that di-  
gette for your quotient, & then worke  
on, as you learned before: for nowe  
haue I tolde you the hole vse of this  
table. How be it, yet that you maye be  
sure to vnderstande it, I wyll se you  
ende this ensample of Diuision by it.  
Nowe therfore begynne agayne. S.  
Fyrste I set downe the sūmes after þ  
cōmen maner thus,                      263845  
Then do I loke ouer the                      64  
diuisor, and fynde there  
263. Now to knowe how many tymes  
64 may be taken out of 263, I resorte  
to the

## Diuision.

to the table afoze sayd, and seke for  
number 263, but it is not there, ther-  
foze (as you bad me) I take a lesser nō-  
ber, the nexte to it, that I can fynde  
in the table, and that is 256, whiche  
number hath agaynst it on the ryght  
hande this digette 4, which I must  
take for the fyyste figure of my quo-  
tient. Then do I (as I learned befoze)  
multiply that quotient into euery fi-  
gure of þe diuisor orderly, withdra-  
winge the summe therof amountyng  
out of the ouer sūme, as here I saye  
fyyste 4 tymes 6 make 24, so I take  
that out of 26 sayenge, 4 out of 6 re-  
mayneth 2, which I write ouer þe 6,  
then 2 out of 2 remayneth nothyng,  
then cancell I 2 and 6, and also 6 in  
the diuisor, and the sūme stande thus.

2

263845 (4  
64

Then do I lykewayes  
saye forth, 4 tymes 4  
make 16, which I take  
out of 23, and there re-  
steth 7 to be sette ouer 3, and that 3  
with the 2 behynde it, and the 4 vn-  
der

der it cancelled, as  
you se here.

27

263845

(4

Then haue I done

64

with the fyrst figure of the quotient.

M. Now set forwarde your diuisor, &  
seke a newe quotient, as you soughte  
this. S. Then thus

27

stādeth the figures,

263845

(4

so that ouer the di-

644

uisor I se 78, which

6

I seke in the table, and can not fynde  
it, therfore I take the nexte lesser, and  
that is 64 the diuisor it selfe. M. So  
must you do whē there is none other.

S. Then agaynste it I fynde this dy-  
get 1, which I must set in the quotiēt  
befoze 4, thus.

27

Then multiply I 6

263845

(41

by 1, and it is but 6

644

Styll. M. You nede

6

not go about to multiplye when the  
quotient is 1, for 1 doth nother mul-  
tiply nor diuide, but in such case, only  
subtracte the diuisor out of the nōber  
that is ouer it. S. Then I take 4 out  
of



# Diuision.

of 8, and there resteth 4, and 6 out of 7, there remayneth 1, so I cancell those numbers, and write the remainers ouer theyr places thus.

1  
274  
263845  
644  
6

Then set I forwarde the diuisor agayne, thus. Where I se ouer the diuisor 144, whiche I seke in the

table, and fynde it not, therfore I take y<sup>e</sup> number in the table that is nexte therto benethe it whiche I fynde to be

128, agaynst which in the ryght syde I fynde 2, which I take for my quotient, and that do I multiplie fyrste into 6, and therof cometh 12, which I take out of 14, and then remayneth 2, that 2 I sette ouer 4, and cancel the other figures, 1, 4, & 6, thus.

Then say I forth, 2 tymes 4 are 8, whiche I take out of 24, and

there

there remayneth 16, of which I write the 6 ouer 4, and the 1 ouer 2, and cancel 2, 4, and 4, thus.

Now agayne I sette forward the diuisor thus.

1  
x 2  
x 7 4 6  
x 6 3 8 4 5 (4 12  
6 4 4 4  
6 6

And seynge ouer it 165, I seke that in the table, but fynde

it not, therfore I take the nexte lesser

1  
x 2  
x 7 4 6  
x 6 3 8 4 5 (4 12  
6 4 4 4  
6 6 6

which is 128, against

whiche I fynde 2, &

do I set into þ quo-

tient, & by it I mul-

tiple fyrst 6, & ther-

of cometh 12, which

I take out of 16, & there resteth 4, the cancel I 1, 6, & 6, & ouer 6 I set 4, thus.

Then do I multi-

ply 4 by 2, and it

maketh 8 whiche

I take out of 45,

and there remay-

neth 37, as in the

next example folowynge.

x  
x 2 4  
x 7 4 6  
x 6 3 8 4 5 (4 12 2  
6 4 4 4  
6 6 6

¶

And

# Diuision

$$\begin{array}{r}
 \times 3 \\
 \times 24 \\
 \times 7467 \\
 \times 63845 \\
 \times 64444 \\
 \times 666
 \end{array}$$

And nowe haue  
 I done. M. Well,  
 now I se that you  
 can worke by this  
 kynd of Diuision,  
 as farre forth as

I taughte you. S. Yea syr, I thanke  
 you, and I fynde in it moche ease and  
 certaynnesse. M. Yet one thynge I  
 doubt whether you perceaue. What  
 yf you dyd fynd in the table the nom-  
 ber that standeth ouer the diuisor,  
 what wold you nexte do? S. I thynke  
 I shulde take the digette agaynste it  
 on the lyfte hande, for the quotiente.  
 M. So is it: and as often as you seke  
 in the table and fynde your number  
 iuste, the digette agaynste it is your  
 true and iuste quotient: I call that a  
 true quotient, yf it be the ryght quo-  
 tient yf you shulde take, though your  
 diuisor multiplied by the same, do not  
 clearly subtracte the number ouer it,  
 but yf there doth somewhat remayne,  
 as it chaunced in all the examples,  
 that



that you dyd worke by: but yf it shuld  
chaunce ( as it doth often ) that your  
diuisor multiplied by your quotient,  
do subtract cleane the nōber ouer it,  
then call I that quotient not only a  
trewe quotiēt, but also a iust quotiēt,  
bycause it doth iustly consume the nō  
ber ouer the diuisor: and that chaun-  
ceth euer moze when the nombze ouer  
the diuisor is iustly found in þ table.  
S. This I shall remember. M. But  
yet one easy poynte moze I wyl tell  
you in this sorte of Diuision, therfore  
marke it well: when you haue found  
in the table, other the same sūme that  
is ouer the diuisor, other the nexte be-  
neth (for lacke of the other) then loke  
what diget standeth agaynst it, take  
that for your quotient, and bycause it  
is some payne to multiply the diuisor  
by the quotient, you shall not nede to  
do it, but onely take the number that  
you founde in the table, and subtract  
that from the ouer number: for yf you  
do multiply the diuisor by þ quotiēt,

M. ii.

that

## Diuision

that wyl be the number that shall amounte, therfore is this waye more easyer. S. So is it, and also more certayner, for such as I am, & myghte quyeckely erre in multiplenge, especially beyng smally practised therein. M. Then proue in some bzeffe example whether you can do it, and so wyl we make an ende. S. I wolde diuide 38468 by 24, therfore fyrst I sette the table thus,

24	1
48	2
72	3
96	4
120	5
144	6
168	7
182	8
216	9

Then set I the two sumes of diuision thus. 38468  
 And ouer the diuisor I fynde 38, whiche I seke in the table, and fynde it not, therfore take I the nexte benethe it, which the table hath, and that is 24, the diuisor it selfe, agaynst whiche is set 1, whiche I take for the quotient, whiche I set in his place. And now I nede not to multiply the diuisor by it, but only to withdraue the diuisor out of the 38 that is ouer it, & so remayneth

neth 14, as thus.

14

Then set I forwarde  
the diuisor, and fynd

78468

(1

24

ouer it 144, as appereth: then seke I

that number in y ta-

14

ble, and fynde it, and

78468

(2

agaynst it is 6, ther-

244

fore I set 6 before 1,

2

for my quotient, and I take that 144

for the iuste multiplication of the di-

uisor by that quotient, and therfore

without any newe multiplicacion, I

do subtracte that 144 from the other

144, and there resteth nothynge, as

here you may se.

24

Therefore I set for-

78468

(16

ward y diuisor, but

244

seyng it wyl not be

2

in y nexte place (for then ouer 2 wold

be nothynge) I set it forwarde twyse,

as you se here.

24

And forbycause that

78468

(160

I coulde not set it in

2444

y nexte place folow-

22

ynge, therfore I sette a cypher in the

M.iii.

quo-



## Diuisiō.

quotiēt, as you se. Then loke I ouer the diuisor, & fynde 68, whiche I can not fynde in the table, therfore take I the nexte beneth it, whiche I fynde in the table, and that is 48, & agaynst it standeth 2, whiche I take for the quotient. And then without any multiplenge of the quotient into the diuisor, I do subtracte that 48 from 68, & there resteth 20, as here appereth.

24 20

38468

24424

2

(1602

And so haue I ended the hole diuisiō. M.

Now can you sufficiently skyll in these

kyndes of Arithmetike. And now for the vse of these two last, that is Multiplicatiō & Diuisiō, I wyll brefely shewe you the feate of Reduction.

## Reduction.



Reductiō is, by which all summes of grosse denominatiō, may be turned into summes of moze subtile denomination: and contrary wayes

wayes all summes of subtyll denomi-  
 nation may be brought to summes of  
 groſſer denomination. S. What call  
 you groſſe denomination and subtyl  
 denominatiō? M. That I cal a groſſe  
 denominatiō, whiche doth contayne  
 vnder it many other subtyler or ſma-  
 ler: as a pound in respecte to ſhyllyn-  
 ges, is a groſſe denominatiō, for it is  
 greater then ſhyllyngeſ, and contay-  
 neth many of them. And ſhyllyngeſ  
 in cōpariſon to poundes, are a subtyl  
 denominatiō, for bycause they are leſ-  
 ſer then poundes, and many of them  
 are conteyned in one of the other: and  
 ſo lyke wayes of other thynges, what  
 ſo euer thyng is compared to other  
 yf it be greater, and conteyneth many  
 of them, it is a groſſer denomination:  
 but yf it be leſſer, ſo that many of the  
 are in the other, then are they called  
 subtyl denominations: wherby you  
 maye perceaue, that one denominatiō  
 maye be called a groſſe denominatiō,  
 and alſo a subtile (that is to ſaye, a

Groſſe deno-  
 mination

Subtile deno-  
 mination.

M.iiii. great



## Reduction.

Grosse and  
Subtile deno=  
mination.

greate and small) in dyuers compa=  
rysons. For Shyllynges compared to  
poundes are a subtyl or smale deno=  
minatiō, but cōpared to penneſ, they  
are a groſſe or great denominatiō. S.  
Now I vnderſtand the name, I pray  
you teache me the uſe. M. The uſe is  
eaſely learned, yf you remembze what  
you haue learned befoze. For yf you  
wyl reduce any ſūme of a groſſe deno=  
mination, into a ſūme of a ſmaler or  
ſubtyler denominatiō, you muſt con=  
ſider how many of that ſubtyler deno=  
mination do make one of the groſſer  
denomination, and by that nōber or  
numerator do you multiply the other  
ſūme: as yf you wolde reduce 20 pou=  
des into Shyllynges, you muſt conſy=  
der, that in a pounce are enclūded 20  
Shyllynges, therfoze multiply the one  
20 by the other 20, and there wyl a=  
munte 400, wherby you may know  
that in 20 pounce are contayned 400  
Shyllynges. Lyke wayes yf you wold  
reduce 30 Shyllynges into penneſ, cō=  
ſide=



Consideringe that in 1 shyllynge are 12 pennies, you must multiply 30 by 12, and it wyl be 360, wherby you fynde that in 30 shyllinges are contayned 360 pennies. And thus maye you reduce any grosse denominatiō, into a moze subtyler, by multiplicatiō, yf you knowe how many of the lesser do make the greater: of whiche thynge I wyl anone geue you a bzeftable for the mozte accustomed kyndes of monye, weyghtes, measures, & tyme, and such lyke, wherby you may know how often eche subtyle denominatiō is contayned in the grosser, whē you shall nede it, for the foresayde kynde of reduction. And also the same shall serue you, yf you wolde reduce any summe of a subtyler denomination, into a sūme of a grosser denominatiō: For in suche reduction you must consider (as in the other forme) how many of the smaler do make the greater, and by that nomber must you deuide the other sūme, and the quotient wyl

### Reduction.

declare, how many of the greater denomination are comprehended in that summe, as for example: If you wolde knowe how many Shyllynge are contayned in 3240 pennes, cōsider that 12 pennes do make 1 Shyllynge, you must deuide that 3240 by 12, & your quotient wyll be 270, wherby you knowe, that so many Shyllynge are in 3240 pennes. But and you wolde knowe farther, how many poundes are in those 270 Shyllynge, seyng e uery pound contayneth 20 Shyllynge, diuide that 270 by 20, and it wyll be 13, and 10 remaynyng: wherby you maye knowe, that in 3240 pennes, or 270 Shyllynge, are 13 poundes & 10 Shyllynge: for euer more the remayner must be named by the name or denomination of the sūme that was diuided, whiche in this place were Shyllynge. And thus maye you do with any other kyndes of denominations. Wherfore to the entent that you may haue a lyghte knowledge in the cōmen

men coynes, weyghtes, measures, & suche other, I haue prepared here a brefe table, which shall suffice to you at this tyme, tyll hereafter at moze conuenient oportunitie, I maye enstructe you more exactly in the same.

**A table for Englysh coynes.**

<b>A souerayne.</b>	<b>A quarter noble.</b>
<b>Halfe a souerayne</b>	<b>A crowne.</b>
<b>A royall.</b>	<b>Halfe a crowne,</b>
<b>Halfe a royall.</b>	<b>A crowne.</b>
<b>A quarter royall.</b>	<b>A grote.</b>
<b>An olde noble.</b>	<b>A harpe grote.</b>
<b>Halfe an olde nob.</b>	<b>A peny of 2 penes</b>
<b>An angell.</b>	<b>A dandypzatte.</b>
<b>Halfe an angell.</b>	<b>A penny.</b>
<b>A george noble.</b>	<b>An halfe penny.</b>
<b>Halfe george nob.</b>	<b>A farthyng.</b>

Englysh  
coynes.

**The valowe of Englyshe  
coynes.**

**A Souerayne is þe greatest Englysh  
coyne, and contayneth 2 Royalles or  
3 Angelles, eyther 9 halfe crownes,  
or 4 crownes and an halfe, that is to  
saye 22 s. 6. d.**

The valowe  
of Englyshe  
coynes

**Halfe**



### Reduction.

Halfe a Souerayne is equall with a Royall.

A Royall contayneth an Angell and halfe, that is to say, 11  $\bar{s}$ . 3  $\bar{d}$ .

Halfe a Royall cōtayneth 5  $\bar{s}$ . 7  $\bar{d}$ . ob.

A quarter of a Royall, contayneth 2 shyllinges 9  $\bar{d}$ . ob.  $\bar{q}$ .

An olde Noble, called an Henry, is worth 2 crownes, or a noble & halfe, that is 10  $\bar{s}$ .

Halfe an olde noble is worth 5  $\bar{s}$ .

An Angell contayneth a crowne and halfe, or 3 halfe crownes,  $\bar{y}$  is 7  $\bar{s}$ . 6  $\bar{d}$ .

Halfe an Angell, is worth 3  $\bar{s}$ . 9  $\bar{d}$ .

A Noble, called a George, is worthe 6  $\bar{s}$ . 8  $\bar{d}$ .

Halfe a Noble is worth 3  $\bar{s}$ . 4  $\bar{d}$ .

A quarter of a Noble (whiche in the olde Statutes is called a farthyng) contayneth 20  $\bar{d}$ .

A Crowne contayneth 5  $\bar{s}$ , and the halfe crowne 2  $\bar{s}$ . 6  $\bar{d}$ . Now be it there is another crowne of 4  $\bar{s}$ . 6  $\bar{d}$ . which is knowen by the rose syde, for  $\bar{y}$  rose hath no crowne ouer it, as in  $\bar{y}$  other crowne

crowne, but it is enuironed on the 4 quarters, w<sup>th</sup> 4 flowre deluces, whereby you may best knowe it. But I wyl returne to speake of the valewe of the coyne, for I entende not now to describe the fourmes of them. Nowe of golde are there no moze comen coyne, and in syluer the greatestt is a Grote, whiche conteyneth 4 pennes. Then is there an other Grote called an Harpe, which goeth for 3 s. Then nexte is the penny of 2 s. and then a dandypatte worth 3 halfe pennes. Nexte it a penny, then a halfe penny, and laste and least of all a farthyng, whose coyne is on y<sup>e</sup> one syde a crosse, and on the other a purculles. This I tell you, bycause I se many that can not knowe a farthyng from a small halfe penny. Now haue I tolde you all y<sup>e</sup> Englyshe coyne bothe of gold and syluer, but yet of the two mozte comen balowers of money spake I nothyng, that is to saye, of poundes and shyllinges, whiche though they haue

Syluer  
coynes.



### Reduction.

haue no coyne, yet is there no name  
more in vse then they, of whiche the  
Myllynge contayneth 12 penne 02 3  
grotes: & the pounde 2 olde Nobles,  
3 George nobles, 02 4 crownes, that  
is to saye 20 s. And this is now the  
rate of Englyshe monye. Here wolde  
I now expresse the valewes of son-  
dyr other coyne of dyuers cōtreys,  
but for thre causes I now refrayne.  
The fyrste & chiefest is, bycause they  
are not currāt by the statutes of this  
realme. Another cause is, by reason  
they are so vncertayne, that they be  
neuer longe at one rate. And agayne  
they are so dyfferent in so many pla-  
ces, that it were matter ynough for a  
great booke to speake suffyciently of  
them all. How be it, yet bycause you  
shall not be all together ignozante of  
them, I wyl shewe you the valewes  
of some, that are most in vse: and fyrst  
of Fraunce. The most cōmen monye  
are deniers, soult, & frances. 12 De-  
niers make 1 s., 20 soult make 1 frāc,  
so that

French  
coynes



so that (as you se) these 3 kyndes are lyke in theyr rate to pennies, Myllynages, and poundes with vs, but that this is þe difference, that theyr denier is but the 9 parte of our penny, and so theyr soult (cōmenly called sowles) go 9 to our Myllynge, and 9 of theyr frances to an Englyshe pounde of money, so þe 3 of theyr frances make a noble. And by those 3 may you practyse how to reduce frenche monye in to Englyshe monye. And as for the reste of theyr coynes I wyll omytte tyll an other tyme, when I entende to shewe you the rate of sundry other kyndes of monie. But now as for the coynes of Flaunders be so chaungeable, that you muste knowe them fro tyme to tyme, or elles you can not reduce them into our monye certaynly. But yet bycause that you shall haue an exāple of theyr monye to exercyse you withall, you shall take those that be mooste cōmen, as Stiuers, bothe single and double, grotes flāmyche,

caro=

Flaunders  
coynes

### Reduction.

carolus, and gyldens. A flēmyſſhe groſe is lytle aboue 3 farthyngeſ Englyſſhe. A ſynge ſtyuer is 1 d. ob. q. The double ſtyuer is 3 d. q̄. The ſpluer Carolus ſynge 2 d. q̄. q. c. The double ſpluer Carolus is 4 d. ob. q̄. q. Then is there alſo þ Carolus gyl- den, whiche is worth 20 ſtyuers. And the flēmyſſhe noble is worth 3 Caro- lus gyldens, and .xii. ſtyuers. But I wyll let theſe paſſe now, exhorteinge you to practyſe to reduce thoſe kyn- des into Englyſſhe monye accordyng as I haue ſet forth here ſolowynge.

2160 deniers make 240 d. 02 20. ſ.

3240 deniers make 360 d. 02 30. ſ.

8352 deniers make 928 d. 02 3 fl. 17

ſ. 4 d. 2160 ſoult make 240 ſhillingſ.

But yf you wyll reduce Flemmyſſhe monye iuſtly, you muſt reduce it fyrſt into the ſmalleſt parte of Englyſſhe monye that is in that coyne, as for example: Yf you wolde reduce 368 double ſtyuers into Englyſſh monye, conſyderyng that a double ſtyuer cō-

tayn



# Reduction.

91

tayneth 3 d. q. you shall fyrste loke  
howe many q. be in  $\text{¶}$  double styuer,  
and you shall fynde them 13, therfore  
multyply the sūme of the styuers by  
13, and then haue you theyr balewe in  
farthynges, which is 4784. Now yf  
you deuide that by 4, then wyl there  
appere the nomber of pēnes, but bet-  
ter it were to diuide it by 48 (for so  
many farthynges are in 1 shyllynge)  
and then wyl the quotient declare  
the sūme of shyllynge. Lykewayes  
yf you wolde reduce any sūme of syn-  
gle styuers into Englysh monye, you  
must multyply the sūme fyrst by 13, &  
then haue you the sūme of q. whiche  
sūme yf you diuide by 8, then wyl  
amount the sūme of pennies: or yf you  
diuide it by 96, the summe of shyllyn-  
ges wyl appere. But this marke in  
all diuision, when you do reduce to  
brynge one denomination into an o-  
ther: yf there be any remayner after  
the diuision, that muste be named by  
the denomination of the grosse sūme

R. that



## Reduction

that was diuided: as for example: I wolde bypnye 254 q. into pēnes, therefore I do diuide that 254 by 4, for so many farthynges make 1 penny, & the quotient is 63, which is the sūme of the pēnes, & then remayneth yet 2, which are farthynges styll, as you may proue by diuidyng. And this must be marked in all diuisiō, namely when it is done for Reductiō. And thus moch haue I said of mony, now wyl I shew you in like sorte y<sup>e</sup> distinctiō of weygh-  
tes, after y<sup>e</sup> statutes of Englād, where the leaste portion of weyghte is com-  
monly a grayne, meanyng a grayne of cozne of whete, dyve, and gathered out of the inyddell of y<sup>e</sup> eare. Of these graynes in tymes passed 32 wayed iuste 1 penny of troye, and then was but 20 penne in an vnce, but nowe are there 48 penne in an vnce, so y<sup>e</sup> there are not fully 14 graynes in 1 penny. But now of vnces (after troye rate, whiche is the standarde of Englande) 12 do make 1 pound. But comenly

Weyghes

Grayne.

an Vnce.

a Penny of  
Troye.

menly there is vsed an other weyght called haberdypoyse, in which 16 vn-  
ces make a pounde. Therfoze when <sup>Haberdypoyse weyghtes.</sup> you wolde reduce vn-  
ces into poun-  
des, you must consider, whether your  
weyghtes be trope weyghtes oꝝ ha-  
perdyepoyse, and if it be troy weight,  
you must dyuyde your vn-  
ces by 12, to brynge them to poundes : but yf it  
be haberdypoyse, you must diuide the  
by 16, Now agayne there be greater <sup>a hundred weyghte.</sup>  
weyghtes, whiche are called a hun-  
dred, halfe hundred, and quarterne, &  
also halfe a quarterne. &c. S. Why : so  
there may be rekened 20 pounde, 40  
pound, 200 pounde, and such vnnu-  
merable. M. All these are nombers  
of weyghte, but they haue not com-  
men weyghtes made to theyꝝ rate, as  
the other haue. And agayn these that  
I dyd name are not iust in nomber as  
they seme by theyꝝ name : foꝝ a hun-  
dred is not iust 100, but is 112 pouñd.  
And so the halfe hundred is 56, the  
quarter 28, and the halfe quarter 14.

R. ii.

And



## Reduction

And this is the comē wepghtes bled  
in most thinges þ̄ are sold by wepght.  
How be it there are in some thynges  
other names: as in wolle 28 pounde  
is not called a quartern, but a todde:  
and the 14 pound is not named halfe  
quarterne, but a stone: & the 7 poude  
halfe a stone. Other names bycause  
they dyffer in many places, and agree  
in fewe, I let them passe. But a sacke  
of wolle by the statutes is lymytted  
to be 26 stone. Now in chese though  
it be sold by the hūdzred, & by the stone  
in some places, yet þ̄ very wepghtes  
of it are cloues and weyes, so that a  
cloue sholde contayne 7 pound: and  
a wey 32 cloues, that is 224 pounde.  
How be it some statute bookes saye þ̄ a  
cloue sholde be 6 pōund, and some say  
also that a wey doth conteyne 36 clo-  
ues, and that is comenly bled, for the  
comen wey is of 256 pound, that is  
36 cloues, rekenynge 7 pound to þ̄  
cloue, & there is 4 pōud ouer wepght.  
And let this suffice you at this tyme,  
tqu=

Wolle weygh  
tes

a Todde

Stone

Sacke

Chese weygh  
tes

a Cloue

Wey



touchyng weyghtes. Now of weygh-  
 tes are made other measures, bothe Measures for  
 for grayne and lyquor. lyquor For a pounce  
 in weyghte, maketh a pynte in mea- a pynte  
 sure, so that 8 pounce (or 8 pyntes)  
 do make a galon: halfe a galon is na- Galon  
 med a pottell, & halfe a pottell is cal- Pottell.  
 led a quarte, whiche contayneth two Quarte  
 pyntes. Now aboue a galon the next  
 measure is a fyken: then a tertian, a Fyken  
 kylderken or halfe barrell, and a bar- Tertian  
 cell. And by those measures are solde Kylderken  
 comely Ale, bere, wyne, and oyle, but- Barrell.  
 ter & sope, salmon, herpynges & eeles:  
 but as these be vnylike thinges, so the  
 measure of theyr vessels do dyffer: for  
 the measures of ale are as foloweth.

of ale { the fyken }  
 { kylderke } cotayneth { 8 }  
 { the barrell } { 16 } galōs.  
 { 32 }

of bere { the fyken } Beere meas-  
 { kylderke } cotaineth { 9 } ures  
 { the barrell } { 18 } galōs.  
 { 36 }

Sope measures, bothe fyken, kyl- Sope mea-  
 derken, & barrell, shulde be all equall ures

# Reduction.

to Ale measures. Moreover the statutes doth lymyte þ weyghte of euery of those thre vesselles beyng empty.

A barrell	} to wey empty	{ 26 13 6 d.	} pounde
Half barrell			
A fyrken			

Herynge.

Herynge also be solde by the same measures, that ale & sope be solde by: but herynge also are solde by tale, 120 to the hūdred, 10 M. to the last.

Salmon and  
Celes

Salmon, and celes, haue a greater measure.

Salmon & Celes	{ the butte þ barrell half bar. the fyrkē	} holdeth	{ 84 42 21 10 d.	} galōs

Now be it, some statutes dyd lymytte eeel vesselles equal to herynge vesselles.

Wyne measu-  
res

Now as for wyne vesselles seldome are smaler then hogges heddes, whiche are of 63 galons: euery hogges hed is two barrells: yet there are many other wyne vesselles, but of them all, se this table, and marke the measures one to an other.

Of



# Reduction.

94

Of wine & Oyle	{	the rondelet	{	18 ſ.	{	ga- lōs
		the barrell		31 ſ.		
		þ hogges hed		63		
		the terttan		84		
		the pype		126		
		the tonne		252		
			hol- deth			

But you shall marke that there be o-  
ther kyndes of terttians, for there be  
tertians (that is to saye thyrdeles) of  
pypes, of hogges heddes, and of ba-  
rels, as well of other thynges as of  
wyne, also of malueseyes and secke. &c.  
The halfe tonne is not called a pype, <sup>a Butte.</sup>  
but rather a butte. And thus moche  
haue I thoughte mete to tell you at  
this tyme. S. And is this alwayes  
true? M. I haue tolde you howe it  
sholde be, but how it is I may not say  
how they do dyffer dayely from theyr  
iust measure: the gagers can tell you  
better then I. But I wyll lette this  
passe now, and speake brefely of the  
other measures, And as of weyghtes  
there dyd sprynge the lyquide mea-  
sures

R. iiii.



## Reduction.

Dye mea-  
sures

asures, wherof I spake laste: so of the same spryngeth dye measures, as peckes, bushels, quarters, and such like, wherby are measured corne and lyke graynes: also salte, lyne, coles, and other lyke. And this is the order and quantitie of them.

a pecke

A pecke is the measure of 2 galons.

Bushell

A bushell contayneih 4 peckes.

Quarter

A quarter holdeth 8 bushelles.

Weye

A weye contayneth 6 quarters.

These are the comen names & measures, but in dyuers places there be dyuers sortes. And þ bushel in many places is 2 bushels, but then is the bushell there called a stryke. And in some places halfe a quarter is called a cornoke. But these diuersities are to many, to tell you brefely them all.

Stryke

Cornoke

And agayne syth they are agaynste þ lawe and statutes, I counte them vnmete to be vsed. But now remayneth yet another kynde of measure, wherby men mete lengthe and bredthe, & those are, an ynche, a fote, and suche other

Measures to  
mete lengthe  
& bredthe

other: whose names and lengthe, this table sheweth.

3 graynes of barley make an ynche. An Inche

12 ynches make a foote. a Foote

3 foote make a yerde. Yarde

3 foote and 9 ynches make an elle. Elle

5 yarden and halfe make a perche. Perche

1 perche in bredthe, and 40 in length Rodde

do make a rodde of londe, whiche some call a roode, some a yerde londe, and some a farthendele.

2 farthendeles make halfe an acre of ground. Farthendele

4 farthendeles make an acre.

Here mought I tell you many thynges elles, touchynge measure. And also how to reduce straunge measures to our measures, but bycause it can not wel be done wout the knowledge of fractions, whiche as yet you haue not learned, I wyll let them passe tyll an other tyme, when I shall enstruct you in the pyncipels of Geometrye, wherin I shulde be enforced els to repete the same often agayne. S. But

R. v.

yet



## Reduction.

The partes of  
Tyme.

a Daye.

a Houre.

Weeke

Moneth

Yere.

yet say, of the partes of tyme, I pray  
you tell me somewhat. M. You knowe  
that a naturall day hath 24 houres,  
and euery houre hath 60 minutes,  
It nedeth not to tel you, that 7 dayes  
make a weke, & 4 weekes make a com  
men moneth, and 13 monethes make  
a yere, lackynge 1 daye and certayne  
howres and minutes: But of that I  
shall enstructe you here after. And  
here wyl I make an ende of Reductiō  
for this tyme, which though it be cou  
ted no kynde seuerall of Arithmetike,  
yet you se it is no lesse nedefull to be  
knownen, nor easyer to be done, then  
any of þ other. S. Mary say. it semeth  
vnto me moch harder then any other  
sorte, for it requyrezeth the knowledge  
of so many thinges. But now say whē  
you se tyme I am redy to lerne forth,  
for as moch of Reductiō as you haue  
taught me I remember: but and yf I  
do at any tyme forgette, I shall haue  
recourse to þ tables, whiche you haue  
set forth for me. M. So do you, for it  
wyl



wyll not be remembred wout exercyse.  
Now with Progressiō I wyll begyn.

### Progression.



Progression is a bryfe  
and quicke addition  
of diuers sūmes pro=  
cedynge by some cer=  
tayne and reasonable  
order: I meane when  
the distaunce of euery 2 numbers is  
equall to the distaunce of the seconde  
number from the fyrste. S. I vnder=  
stande you not well. M. By an exam=  
ple it wyll be playner, as here: 1, 2, 3,  
4, 5, 6, here you se the seconde to dyf=  
fer from the fyrste but by 1, & so doth  
all the other, one excede an other by 1  
styll to the ende. S. This I perceaue.  
M. And lyke wayes here 4, 7, 10, 13,  
16, 19, 21, 24. S. Yea, they procede by  
y dyfference of 3. M. And so I meane,  
that Progression is an arte howe to  
adde all such nombres and other lyke  
together, moch qucklyer then by cō=  
men Addition, and that by this mea=  
nes

### Reduction.

nes: Tell how many numbers there are, and yf they be odde, write theyr sūme downe by it selfe: as in this example, 2, 4, 6, 8, 10, 12, 14, where the numbers are 7, as you maye se, therefore set downe 7 in a place alone, as I haue done in the margent here: the  
7 adde together the fyrst number and y laste, as in this exāple: adde 2 to 14, and that maketh 16, take halfe of it, and multiply by that 7, whiche you noted for the number of the places, & the sūme that amounteth, is the sūme of all those figures added together: as in this example, 8 multiplied by 7, make 56, and that is the sūme of all the figures. S. That wyll I proue by an other example: I wolde knowe how moche this sūme is, 5, 8, 11, 14, 17, 20, 23, 26, 29, I tell the places, & they are 9, that I note: Then I put the fyrste number 5, and the laste 29 together, and they make 34, I take the halfe of it that is 17, and multiply by 9, and it maketh 153, That you  
saye



saye is the sūme of all the numbers.  
M. So shall you fynde it, yf you trye  
it. S. How shall I trye it? M. By Ad-  
ditiō: For yf you adde all the parcels  
together, you shall se the same sūme  
amount, yf you dyd worke well: and  
that Additiō trieth all kyndes of Pro-  
gression. S. Then I can adde by Pro-  
gression, yf the numbers of the par-  
cels be odde. But what yf they be  
euen: as in this example, 1, 2, 3, 4, 5,  
6, 7, 8. M. When the number of the  
parcels be euen, then note that also,  
as you dyd before, & lyke wayes adde  
the fyrste sūme to the laste, and by the  
halfe of the number of the places do  
you multiplie it, as in your example,  
the parcels are 8, that note I, then  
addynge the fyrste sūme to the laste,  
there amounteth 9, that do I multy-  
ply by the halfe of parcels, that is by  
4, and it maketh 36, which is y<sup>e</sup> sūme  
of the 8 parcels. But yf you wyl take  
one rule for these both, do thus. Mul-  
tiply the halfe of the one by the other  
hole



## Progression.

hole, and the sūme wyll amounte all one. For somtyme it chaunceth that the parcelles be odde, so that they halfe can not be taken: and somtyme it chaunceth the addition of the fyrste number and the laste to be odde, so þe the halfe of it can not be taken, but they wyll neuer be both odde. S. The I perceauē this, yf there be no more longynge to it. M. This is ynough for Progression Arithmetically, how be it, there is another maner of Progression called Geometricall, when the nombres encrease by a lyke proportion, that is, yf the seconde number contayne the fyrst 2, 3, or 4 tymes and so forth, then the thyrde containeth the seconde so many tymes also, and so the fourthe the thyrde, and the fyfte the feurth: wherfore I set those thre examplēs.

Here in the fyrst example you se, that  
 3, 6, 12, 24, 48,  
 1, 3, 9, 27, 81,  
 2, 10, 50, 250,  
 euery number containeth the other,  
 (that goeth nexte before hym) 2 tymes

Progression  
Arithmetically

Geometricall

mes: and in the second example 3 tymes: in the thyrde example 5 tymes. Nowe yf you wyl knowe howe to fynde easely the summe of any suche nombers, do thus: consyder by what number they be multiplyed, whether by 2, 3, 4, 5, or any other, and by the same nōber do you multiply the laste sūme in the Progression. S. I praye you worke it by this example, 2, 8, 32, 128, 512, 2048, whiche summe I haue encreaseth by the multiplicacion into 4. M. Then must I multiply the laste sūme (whiche is 2048) by 4 also, and it wylbe 8192. Now must I bate from this sūme the fyrst nombze of þe Progression, whiche here is 2, then resteth 8190, which sūme I must diuide by 1 lesse then was the number that I multiplyed by. Seynge then I multiplyed by 4, I muste diuide by 3, so diuidynge 8190 by 3, þe quotient wyl be 2730, which is the sūme of all the Progressyon. And now to proue whether you can do the same, I geue you these



### Reduction.

these numbers to adde, 3, 15, 75, 375,  
1875, 9375, 46875. S. I can not wel tel  
by what nōber this progression doth  
encreace. M. In any such doubte do  
thus: Diuide the seconde number by  
the fyrste, and the quotient wyll shew  
you the number that engendzeth the  
progression. S. Then is that number  
in this example 5, for so many tymes  
is 3 in 15. M. So is it. Now worke  
as I taught you. S. The last nombze  
is 46875, whiche I multiply by 5,  
and it yeldeth 234375, frō whiche I  
bate the fyrst nombze of þe progression  
that is 3, and there resteth 234372,  
which I diuide by 4 (for that is 1 lesse  
then 5) & the quotient is 58593, which  
is the hole sūme of the Progression.  
M. Now yf you remēbre wel this, you  
haue learned the arte of Progressyon  
bothe Arithmetical, and also Geome-  
trical: whiche you maye proue other  
by Subtractiō of eche nombze alone  
from the sūme, and so wyll there no-  
thyng remayne, other by addyng to-  
gether



gether of all the parcelles, for so wyl  
the same sūme amount. And now for  
the vse of this rule I wyl put forth  
to you certayne questyons, whiche  
some do referre to Addition, but not  
so iustly, as I do vnto this rule of  
Progression: and some as vncircum-  
spectly referre the same to Duplatiō.

The fyrst question is this.

**E**Xt I solde vnto you a horse, ha-  
uynge 4 shoes, and in euery shoe 6  
nayles, with this condition, that you  
shall pay for the fyrste nayle 1 ob. for  
the second 2 ob. for the thyrde 4, and  
so forth doublyng vnto the ende of all  
the nayles. Nowe I aske you howe  
ynochē wolde the hole pryce of þ horse  
come vnto. S. fyrst to knowe the nom-  
ber of the nayles, I must multiply 6  
by 4, and þ maketh 24, then I wyl  
do thus. I wyl wryte the number of  
the nayles euery one in order from 1  
to 24, and agaynste eche nombze of  
nayles the sūme of halfe pēnes dewe,  
as the order of Duplacion teacheth,

Questiō of sel-  
lyng of a horse

D.

and

# Progression

and in this figure appeareth.

Then do I resorte  
to the rule of Pro-  
gression, where I  
consyder, that the  
encreace of this  
sūme procedeth by  
multiplication of  
2, and therfore I  
do multiply þ last  
sūme by 2 also, & it  
yeldeth 16777216,  
from whiche I a-  
bate the fyrste nō-  
ber, whiche is 1,  
and then resteth  
16777215, which I  
shulde diuide by 1  
lesse, then I dyd  
multyply. But se-  
ynge that it is 1, I  
nede not to diuide  
it, for 1 (as I haue  
before sayde) both  
nother multiplie

1	1
2	2
4	3
8	4
16	5
32	6
64	7
128	8
256	9
512	10
1024	11
2048	12
4096	13
8192	14
16384	15
32768	16
65536	17
131072	18
262144	19
524288	20
1048576	21
2097152	22
4194304	23
8388608	24



no: diuide: therfore I take that same  
 16777 215, for the hole summe of halfe  
 penne, whiche by reduction I fynd  
 to be 699050 s. and 7 d. ob. that is  
 34952 l. 10 s. 7 d. ob. M. That is well  
 done: but I thynke you wyl bye no  
 horse of the pryce. S. No sy, yf I be  
 wyse. M. Well, then aunswer me to  
 this questyon.

A lord deliuered to a brycke layer,  
 a certayne number of lodes of brycke,  
 wherof he wylled hym to make 12 wal  
 les, of such sorte that the fyfste walle  
 shulde receaue 2 thyrdeles of the hole  
 number: and the seconde 2 thyrdeles  
 of that, that was leftte: and so euery  
 other 2 thyrdeles of that that remay  
 ned: and so dyd the brycke layer. And  
 when the 12 walles were made, there  
 remayneth 1 lode of brycke. Nowe I  
 aske you how many lode went to eue  
 ry wall, and howe many lode was in  
 the hole? S. Why sy: it is vnpossyble  
 for me to tell. M. Nay, it is very easy  
 yf you marke it wel: Marke well, & I

Questyon of  
 bryck laynge.

D. ii.

sayd



### Progression

sayde that euery wall shulde receaue  
2 thyndeles of þe sūme that was lefte.  
Now take awaye 2 thyndeles from  
any summe, & you must nedes graūt,  
that that which remayneth, is 1 thynde-  
le of the sūme laste befoze: example  
of 9, from which yf you take 2 thyn-  
dels, there wyl remayne 3, which is  
1 thynde of 9: lyke wayes from 3 bate  
2 thyndeles, and there wyl remayne 1.  
S. This is true, and now I perceauē  
that the least wall had but 2 lode of  
brycke. M. And by the same reason  
may you know how many lode euery  
wall had, accordynge as this figure  
doth shewe, & lyke wayes what þe hole  
sūme of bryckes was: for yf you make  
12 summes multiplenge by 3 styll,  
from the last remayner, as you se here  
on the lefte syde of þe table, there wyl  
appere all the remayners after euery  
wall: and yf you multiply the laste of  
those 12 summes by 3 also, then wyl  
that be the summe of the lodes, which  
were delyuered to the brycke layer.

Agayne

1	12	2
5	11	6
9	10	18
27	9	54
81	8	162
243	7	486
729	6	1458
2187	5	4374
6561	4	13122
19683	3	39366
59049	2	118098
177147	1	354294
531441		

Agayne, yf you do double euery remainer, as you se at the ryght syde of this table, those numbers wyll shew the summe of lodes that went to eche wall: wherby also you may perceaue, that eche wall was 3 tymes so greate as the nexte lesser. S. Lo, nowe it appeareth easy ynoughe. Now surely I se that Arithmetike is a ryghte excellent arte. M. You wyll saye so when

D. iii. you

### Progression.

you knowe moze of the vse of it: for  
this is nothyng in comparison to o-  
ther poyntes that maye be wroughte  
by it. S. Then I beseeche you sye, lease  
not to instruct me farther in this wo-  
derfull connyng. M. By the order of  
the science (as men haue taughte it)  
there shuld folowe nexte, the Extra-  
ction of rootes of nomber, whiche by  
cause it is somewhat harde for you, yet  
I wyll let it passe for a whyle, & wyll  
teache you the feate of þe rule of Pro-  
portions, whiche for his excellency is  
called the Golden rule. Whose vse is  
by 3 nombers knowen, to fynde out  
another vnknowen, which you desyre  
to knowe: as thus. If you paye for  
your boorde for 3 monethe 16 s. how  
moch shall you paye for 8 monethes.  
To knowe this & all suche lyke que-  
stions, you shall consyder which two  
of your 3 nombers be of one denomi-  
nation, and set those 2, the one ouer  
the other, so that the vndermost be it,  
that the questiō is asked of: As in my  
questiō.

The rule of  
proportions,  
called the  
Golden rule

Questiō of be-  
pyng.



question 3 and 8 be bothe of one denomination, for they bothe be monethes: and bycause 8 is the number þ the quotiēt is asked of, I set then one ouer þ other, and 8 vndermost, thus, with such a croked draught of lynes.

3  $\begin{array}{r} \text{Z} \end{array}$  Then do I set the other nōber, 8  $\begin{array}{r} \text{Z} \end{array}$  whiche is 16, agaynst 3 at the ryghte syde of the lyne, thus. 3  $\begin{array}{r} \text{Z} \end{array}$  16

And now to knowe my que- 8  $\begin{array}{r} \text{Z} \end{array}$

styon, thus muste I do: I must multiply the lowermost on the left side by that on the ryghte syde, & the sūme that amounteth I must diuide by the hyst on the lyfte syde: Or in playner wordes thus: I shall multiply the nōber, of whiche the questyon is asked (whiche is called the thyrde number)

The Thyrde  
number

by the number of an other denomination (whiche is called the second) and the Seconde that sūme that amounteth, muste I diuide by the summe of lyke denomination, whiche is called the fyrste.

the fyrste

Then for the knowledge of this que-

. D. liii. stion

# Progression.

tion, I multiply 8 into 16, & there  
amounteth 128 which I diuide by 3,  
and it yeldeth 42  $\bar{s}$ . and 2  $\bar{s}$ . remay-  
neth, which I turne into pennies, &  
they be 24  $\bar{d}$ . of which the thyrde part  
is 8  $\bar{d}$ . so the thyrde parte of 128  $\bar{s}$ .  
is 42  $\bar{s}$ . 8  $\bar{d}$ . whiche sume I wyte at  
the ryght hande of  $\bar{s}$  figure agaynste  
8, thus.

3  $\nearrow$  16  $\bar{s}$ .

And hereby I know, 8  $\nearrow$  42  $\bar{s}$ . 8  $\bar{d}$ .  
that, yf 3 monethes bordyng do come  
to 16  $\bar{s}$ . that 8 monethes bordyng  
wyl come to 42  $\bar{s}$ . 8  $\bar{d}$ . & lyke wayes  
of any other lyke questyon. But here  
muste you marke, that the fyrst nom-  
ber and the thyrde be of one denomi-  
nation, and also the seconde and the  
fourthe, for whiche you seke: or elles  
be of suche denominations, that you  
in workyng maye bypge them into  
one: As yf a man shulde aske me this  
question: 12 weekes forneyng coste  
me 14 nobles, how many poudes is  
that in one yere? Here you se no 2 nō-  
bers of one denomination, but yet in  
woz-

Questiō of ex-  
pences.



woꝝkynge you maye turne them into  
lyke denominations, as thus: Turne  
the one yere into 52. wekes, and the  
fourth sūme wylbe nobles, by the or-  
der of the woꝝkynge. Then to knowe  
this question, multiply þ̄ thyrde sūme  
52 by the seconde 14, and the sūmme  
wylbe 728, that diuide by 12, and it  
wyl be 60, and 8 remaynyng, which  
yf you turne into Shillynge they wyl  
be 53 s. 4 d. whiche yf it be diuided  
by 12, wyl yelde 4 s. 5 d. & the thyrde  
parte of a penny: put this 60 nobles  
(which maketh 20 li) with the 4 s. 5 d.  
& q̄. and lytle moze: for the sūme that  
answereth to the questyon and it is þ̄  
expense of a yere, and the sūmes wyl  
be thus.

12  $\nearrow$  14 nobles.

And take this 52  $\nwarrow$  60, 4 s. 5 d. q̄.  
for a generall rule, that euermoze the  
thyrde nomber be it, that the quotient  
is ioyned with: and the fyrste, the nō  
ber that is of the same denominatiō,  
then must the seconde nedes be that  
other. And remēbze also that þ̄ place

A general  
rule.

D. b.

of



# Progression.

of the fyrste number is the hyghest on the lefte syde: and the place of the seconde ryght agaynst it on the ryghte syde: the place of the thyrde number is vnder the fyrste, as by those examples you haue sene. S. This I truste I can do. M. But and the questyō be asked thus: In 8 wekes I spende 40  $\bar{s}$ . howe longe wyll 105  $\bar{s}$ . serue me? Though the order seme vnylike, yet take you 105 for the thyrde number, and 40 beyng of the same denominacion for the fyrst, and the 8 for the seconde. Then multiply 105 by 8, and it wyll be 840, whiche yf you diuide by 40, it wyll yelde 21, whiche is the fourth number, & showeth how many wekes 105  $\bar{s}$ . wyll serue, yf you spende 40  $\bar{s}$ . in 8 wekes. The figure of this questyon is this, as yf

40	Z	8
105	Z	21

you shuld say: yf 40  $\bar{s}$ . serue for 8 wekes, 105 serue for 21 wekes. Other diuersites there be of workinge by this rule, but I had leauer that you wolde learne this one well, then

Questiō of expences.

then at þ begynnynge to trouble your mynde w many formes of workynge, syth this way can do as moch as al þ other, and here after you shall learne the other moze conueniently. But yet befoze we make an ende of this rule, this shall you note, that there is another order quyte contrarye to this þ you haue learned. For in this rule hetherto, euermoze loke howe moche the thyrde number is greater then the fyrste, so moche the fourth number is greater then the thyrde: and contrary wayes, loke how moch the fyrst sūme is greater thē þ thyrde (yf it do chaūce so) so moche is the second sūme greater then the fyrste. But there is a contrary order, as this: That the greater the thyrde sūme is aboue the fyrst, the lesser the fourth summe is beneth the seconde: and this rule you maye call the backer rule: as in examble. If I haue bought 30 yardes of cloth, of 2 yardes bredthe, and wolde bye canvas of 3 yardes brode to lyne it with.

The Backer  
rule.  
Questiō of by  
enge of clothe



# Progression.

with all, how many yardes shulde I  
 nede? S. Why? there is none so brode.  
 M. I do not care for that, I do putte  
 this example onely for your easy vn-  
 derstandyng: for yf I shulde put the  
 example in other measures, it wold be  
 harder to vnderstand: but now to the  
 mater. If you wyl knowe this que-  
 styon, set your nombres as you dyd be-  
 fore: but you shall multiplie now the  
 fyrste nombre by the seconde, and that  
 aryseth therof, you shall diuide by the  
 thyrde, which thyng yf you do here, I  
 meane, yf you multiplie 30 by 2, it  
 wyl be 60: which sūme yf you diuide  
 by 3, there wyl appere 20, wherby  
 I knowe, that yf 30 yardes of clothe  
 of 2 yardes brode shulde be lyned w  
 canwas of 3 yardes brode, 20 yardes  
 of canwas wolde suffice, as this fi-  
 gure showeth also.

$$\begin{array}{r} 2 \quad 30 \\ 3 \quad 20 \end{array}$$

And now bycause  
 you founde faulte at my exāple, how  
 say you perceauē you this? S. Yea sy,  
 I suppose. M. The answer me to this  
 que-



question: How many elles of canvas  
of elle bredthe, wyl serue to lyne 20  
yardes of seye, of 3 quarters of a yarde  
broad? S. In good fayth sy? I can not  
tell, for I knowe not howe to brynge  
the sūmes to lyke denominatiōs. M.  
Then I wyl tell you, syth there is  
mencion here of quarters, & agayne  
euery one of the measures both elles  
and yarde may be parted into quar-  
ters, do you parte them so, bothe in  
bredthe & lengthe, and then put forth  
the questyon by quarters. S. Then I  
shal say thus: how many quarters of  
canvas of 5 quarters broad wyl lyne  
80 quarters of 3 quarters broad? M.  
Now answere to the questyō. S. fyrst  
I wyl set them downe in theyr forme  
thus: for 5 is ioyned with 3  $\frac{80}{5}$   
the questyon, and is ther-  $\frac{3}{5}$   
fore the thyrde number, then is 3 the  
number of the same denoinynation, I  
meane bycause they be bothe referred  
to bredthe. Now I multiply 80 by 3,  
and it is 240, whiche I diuide by 5,  
and

# Progression.

and it yeldeth 48. Then saye I, that 48 quarters of 5 quarters brode, wyl suffice to lyne 80 quarters of 3 quarters brode. M. Turne the quarters agayne into elles and yardes. S. The I say, ethat 9 elles and 3 quarters of a yarde of elle brode, wyl serue to lyne 20 yardes of 3 quarters brode, as this figure sheweth.

$$\begin{array}{r} 3 \quad 80 \\ 5 \quad 48 \end{array}$$

M. This rule is so profit-  
table for all estates of men, that for this rule onely (yf there were no more but it) all men were bounde hyghly to esteeme Arithmetike. By this rule maye a capitayne in warre worke many thynges, as I wyl hereafter instructe you abundantly: onely now I wyl shewe you this one exāple. Yf it shuld chaunce a capitayne, whiche hath 40000 souldyours to be so enclosed w his ennemyes, that he could haue no freshe purueyaunce of bytayles, and that the bytayles whiche he hath, wold serue that arinye but only 3 monethes, how many men shuld he dymysse, to make that bytayle to suffice

Quarters of 5 quarters  
wyl suffice to lyne  
an armye.



fyce the resydue 8 monethes: S. As  
 you taughte me, I set þ nōbers thus:  

$$\begin{array}{r} 3 \overline{) 40000} \end{array}$$
 sayeng: If 3 monethes  
 8 suffyce 40000, to how  
 many wyl 8 monethes suffyce: To  
 know this, I multiply þ fyrst nōber 3  
 ito þ secōd 40000, & it yeldeth 120000,  
 which summe, I diuide by 8 & there  
 wyl be in the quotiēt 15000 whiche yf  
 I do subtracte frō 40000, þ remayner  
 wyl declare þ he must dimisse 25000,  
 as this figure sheweth. 
$$\begin{array}{r} 3 \overline{) 40000} \\ 15000 \end{array}$$
  
 M. Well, syth you per-  
 ceauē now the vse of this rule, I wyl  
 shewe you other, which ensewe of the  
 same. And fyrste the double rule, whi-  
 che is so called, bycause there is in it  
 double workynge, by whiche thyng  
 onely it dyffereth from this. S. Then  
 by an example I shall vnderstande it  
 well ynough. M. So shall you: and  
 let this be the exāple. Yf the carpage  
 of 100 pound weyghte 30 myles, do  
 coste 12 d. how moch wyl þ carpage  
 of 500 weyghte coste, beyngē carped  
 100 myles: S. I praye you shewe me  
 the

The Double  
 Rule.



# Progression.

the workynge of it. M. You muste  
make two workynge of it: the fyrste  
thus. Yf 100 pound weyghte cost 12  
d, how moch wyll 500 pounde coste?  
Set your figure thus,  $\begin{array}{r} 100 \\ 500 \end{array} \begin{array}{l} 12 \\ 6000 \end{array}$   
and multiply 500 by 12, and therof amounteth 6000, whiche  
yf you diuide by 100, þ quotient wyll  
be 60: that is the pryce of 500 for 30  
myles. Then begyn the second worke  
sayenge: yf 30 myles cost 60 d. how  
moche wyll 100 myles cost? Set your  
figure thus,  $\begin{array}{r} 30 \\ 100 \end{array} \begin{array}{l} 60 \\ 6000 \end{array}$   
And then multiply 100 by 60, wherof amounteth 6000, whi-  
che beyng diuided by 30 wyll yelde  
200. Then you may say that so many  
pennys shall cost the carpage of 500  
pounde weyghte, 100 myles after the  
rate of 12 d. for the 100 carped 30 my-  
les. S. Nowe I perceaue it also. M.  
Then answer me to this question, 30  
busshels of whete sowed, yeldeth in  
one yere 360, how many wyll 80 bus-  
shels yelde in 7 yere? I meane, sow-  
ynge

Questyō of so-  
weynge.

ynge every pere of those 7 styl 80  
bushelles. S. fyrste I saye, that yf  
30 bushels yelde 360 in one yeare, the  
80 bushelles wyll yelde 960, in one  
yeare. Then for the seconde worke, I  
saye: yf one yeare yelde 960, then 7  
yeare wyll yelde 6720, as these two  
figures do

30  $\nearrow$  360    1  $\nearrow$  960  
80  $\nearrow$  960    7  $\nearrow$  6720

showe. But nowe sy, yf I set forthe 30 bus-  
shels of corne to an other man for 7  
yeare, agreynge so, that he shall sowe  
every pere the hole encrease of þ corne  
and I at the ende of those 7 yeares to  
haue the halfe of the hole encrease, I  
wold knowe how many bushels wyll  
there amount to my parte, supposyng  
the encrease to be after the rate of the  
last question, for 30 bushels in 1 pere  
360. M. In such a questyon you must  
haue so many severall workynges, as  
there be yeares: as for example. In þ  
fyrste yeare 30 bushels yelde 360, the  
to knowe the yeldynge of the seconde  
pere, I must say: yf 30 yelde 360, how

Question of  
corne.

þ. many

# Progression

many yeldeth 360 woorkes by your rule, and you shall fynde 4320. Then saye for the thyrde yere : yf 30 yelde 360, how many wyll 4320 yelde: you shall haue 51840, and so euery yere, multiplyenge þ hole encrease by 360, and diuidynge it by 30, the encrease of the next yere wyll amouit, as these 7 figures do orderly declare,

<p>a</p> $30 \text{ --- } 360$	<p>b</p> $\begin{array}{r} 30 \text{ --- } 360 \\ 360 \text{ --- } 4320 \end{array}$
<p>c</p> $\begin{array}{r} 30 \text{ --- } 360 \\ 4320 \text{ --- } 51840 \end{array}$	<p>d</p> $\begin{array}{r} 30 \text{ --- } 360 \\ 51840 \text{ --- } 622080 \end{array}$
<p>e</p> $\begin{array}{r} 30 \text{ --- } 360 \\ 622080 \text{ --- } 7464960 \end{array}$	
<p>f</p> $\begin{array}{r} 30 \text{ --- } 360 \\ 7464960 \text{ --- } 89579520 \end{array}$	
<p>g</p> $\begin{array}{r} 30 \text{ --- } 360 \\ 89579520 \text{ --- } 1074954240 \end{array}$	

where



where I haue set 7 letters for the 7  
 yeares, of whiche the fyrst is set with  
 out arte, bycause that is the encrease  
 whiche you do presuppose, and þe laste  
 nomber of eche other doth shewe the  
 encrease of the yeare that it standeth  
 for, which the letters doth declare, so  
 that the encrease of the 7 yeare is  
 1074954240 bushelles: howe many  
 quarters that is, and also how many  
 weyes, you maye by Reduction sone  
 fynde. Now with one questyon moze  
 I wyll proue you. If 6 mowyers do  
 mowe 45 acres in 5 dayes, how ma-  
 ny mowyers wyll mowe 300 acres in  
 6 dayes? S. If 45 acres do requyre  
 6 mowyers, then 300 acres requyeth  
 40. Now agayne yf 5 dayes requyre  
 40 mowyers, then 6 dayes nedeth  
 but 33 mowyers. M. Why do you not  
 make mentiō of the 2 that remayneth  
 in the last diuision? for the last parte  
 of the questiō is wrought by the bac-  
 ker rule, where the fyrst nomber 5, is  
 multiplyed into the seconde, that is

Questiō of  
 mowynge.

### Progression

40, wherof amounteth 200, whiche  
yf you diuide by the thyrde number 6,  
the quotient wyll be 33, as you sayd,  
but the wyll there remaine 2, which  
can not wel be diuided into 6 partes:  
howe be it you may vnderstande by  
6 parte of 2, the thyrde parte of one  
mannes worke, whiche you must put  
to the 33: or elles you maye saye that  
33 worke men wyll ende all the 300 a-  
cres in 6 dayes, saue two mens worke  
for one daye, or two dayes worke for  
one man. But suche broken nomber,  
called fractions, you shall here after  
more better perceaue, when I shall  
holly enstruchte you of them. But now  
wyll I shewe you of the rule of felow  
shyp or company, whiche hath sundry  
operations accordyng to the dyuers  
nōber of y cōpany. This rule is some-  
tyme without difference of tyme, and  
sometymes there is in it dyfference of  
tyme. fyrst I wyll speake of that w-  
out dyfference of tyme, of whiche let  
this be an example. Four marchan-  
tes

Rule of felow  
shyp

Without  
tyme.

tes of one company made a bancke of  
monye dyuerſly, for the fyrſte layde in  
30 li. the ſeconde 50 li. þ the thyrde 60 li.  
and the fourth 100 li. whiche ſtocke  
they occupied ſo longe, tyll it was en  
creaſeth to 3000 li. Now I demaund  
of you, what ſhulde eche man receaue  
at the partynge of this monye? S. I  
perceave that this rule is lyke the o-  
ther, but yet there is a differēce, whi-  
che I perceave not. M. Then wyl I  
ſhewe it to you. fyrſt by addytiō you  
ſhall bynge all the partycular ſum-  
mes of þ marchaūtes into one ſūme,  
whiche ſhall be the fyrſt ſūme in your  
wozkyng by the golden rule: and þ  
hole ſūme of the gaynes in the ſtocke  
ſhalbe the ſeconde ſūme. Now for the  
thyrde ſūme you ſhall ſet the portion  
of eche man, one after an other, & then  
wozke by the goldē rule, & the fourth  
ſūme wyl ſhewe you eche mans gay-  
nes: as in example. The parcels of  
thoſe foure marchaūtes make in one  
ſūme 240 li. ſet that in the fyrſt place,

ſūme

D.iii. the



# Progression.

the gaynes in the seconde, & the fyrste mans portion of stocke in the thyrde place, thus.

Now multiply the seconde by the thyrde, and it wyl be 90000, which you shal diuide by 240, and there wyl appere 375 li. thus,

$$\begin{array}{r} 240 \overline{) 3000} \\ 30 \overline{) 375} \end{array}$$

and that is the gaynes for the fyrst man.

Now for the second man, set the 50 li. that he brought in the thyrde place, and worke as befoze, and his parte wyl be 625 li. as this figure showeth.

Lyke wayes for the thyrde man, sette his monye whiche was 60 li. & his parte of gaynes wyl be 750 li. as here appereth.

And so for y fourth man, yf you set his summe, whiche is 100 li. his gaynes wyl be 1250 li. as the pzoze wyl declare.

240  $\overline{) 3000}$  3000  
 60  $\overline{) 750}$  750  
 100  $\overline{) 1250}$  1250  
 S. This I perceauē,  
 but is there any way to exampr whe-  
 ther I haue wel done or no? M. That  
 muste

must you do by one commynne p<sup>ro</sup>fe,  
 which serueth to the golden rule, and  
 all other ensewnges of the same. And  
 that is this: Chaunge the standyn-  
 ges of the numbers, and set the th<sup>y</sup>d <sup>p<sup>ro</sup>fe.</sup>  
 in the fy<sup>r</sup>st place, the fourth in the se-  
 conde place, and the fy<sup>r</sup>st in the th<sup>y</sup>d  
 place, and then worke by the golden  
 rule, and yf you haue done well, the  
 fourth number now wyl be the same,  
 that was the seconde befoze. As fo<sup>r</sup> ex-  
 ample, I wyl take the laste worke,  
 whiche was this:

whiche to examyne 
$$\begin{array}{ccc} 240 & \text{Z} & 3000 \\ 100 & & 1250 \end{array}$$

$$\begin{array}{ccc} 100 & \text{Z} & 1250 \end{array}$$
 I alter as I said thus.

$$\begin{array}{ccc} 240 & \text{Z} & 3000 \end{array}$$
 Now yf I multiplye y<sup>e</sup>  
 secōd nōber by y<sup>e</sup> th<sup>y</sup>d, & diuide that,  
 that amounteth by the fy<sup>r</sup>st, then wyl  
 the fourthe number be 3000, whiche  
 was the second befoze, as you se here.

$$\begin{array}{ccc} 100 & \text{Z} & 1250 \end{array}$$
 which is a token, that

$$\begin{array}{ccc} 240 & \text{Z} & 3000 \end{array}$$
 I haue well done.

But as in a syngle rule one p<sup>ro</sup>fe  
 thus is sufficient: so in a rule where  
 many operations be, you must turne

D.iiii. every

# Progression.

euery of them, as I haue done with  
this one. S. Then for the p<sup>ro</sup>fe of the  
fyrst worke of this rule I shuld turne  
the numbers thus.

$$30 \begin{array}{r} \diagup \\ \diagdown \end{array} 375$$

And for the second thus.

$$240 \begin{array}{r} \diagup \\ \diagdown \end{array}$$

$$50 \begin{array}{r} \diagup \\ \diagdown \end{array} 625$$

And for the thyrde,

$$240 \begin{array}{r} \diagup \\ \diagdown \end{array}$$

thus.

$$60 \begin{array}{r} \diagup \\ \diagdown \end{array} 750$$

And in eche of them,

$$240 \begin{array}{r} \diagup \\ \diagdown \end{array}$$

if the working were true, the fourth  
number wyl be styll 3000. M. Well,  
now an other example wyl I put to  
you not of gaines, but of losse: for one  
reason serueth for bothe. If thre mar  
chauntes in one shyppe, and of one fe  
lowshyp, had bought marchaundyse,  
so that the fyrste had layd out 200 li.  
the seconde 300 li. and the thyrde 500  
li. And it chaunced by tempest the  
dyd cast ouer boorde into the see mar  
chaundyse of the balewe of 100 li. how  
moch shuld eche man bere in this losse?  
S. If I shall do in this as you dyd in  
the other questyō, then must I ioyne  
theyr thre portyōs together, 200, 300,  
& 500, whiche maketh 1000: then say

I

Question of  
losse.



If, yf 1000 lese 100, then shal 200 lese 20, and 300 shal lese 30, and 500 shal lese 50, as by these.iii. figures it doth appeare playne.

1000  $\searrow$  100  
200  $\searrow$  20  
300  $\searrow$  30  
500  $\searrow$  50

M. Thus you perceave the vse of the rule without tyme. And that you may as well perceave the same with diuer site of tyme, I propose this example. Iii. marchautes made a cōmen stock, which at the yeares ende was encreased to 35145 li. Now to knowe what shalbe eche mānes porcyō of gaynes, you muste knowe eche mans stocke & tyme of continuāce. The fyyste man of these.iii. layde in 669 li. which he dyd take from the stocke agayne at the ende of 10 monethes. The second mā layd in 810 li. for 8 monethes. The thyrde layde in 900 li. for 7 monethes. And the fourth layde in 1040 li. for 12 monethes. This question shal you

The rule of  
fellowshyp  
Wyth tyme.

Questiō of a  
bancke.

D. b. exa-

### Progression.

examyn as you dyd the other befoze,  
sauynge, that where as in the thyrd  
place of the figure, you set eche mans  
sūme alone, here you shal set the same  
beyng multiplied by þe nōber of theyr  
tyme, and lyke wayes in þe fyrst place  
of the figure you shal set theyr hole  
summes so multiplied by theyr tyme,  
and added into one summe, as thus.  
The fyrst mans summe is 669 li. whiche  
I multiplye by 10 (that was the  
number of his tyme) and it maketh  
6690. The seconde mans sūme 810 li.  
multiplied by 8 (which was his time)  
maketh 6480. The thyrd mans sūme  
900 li, multiplied by 7 (for that was  
his tyme) yeldeth 6300. The fourthe  
mans sūme was 1040 li. & his tyme  
12, multiply the one by the other, and  
it wyll be 12480. These.iiii. summes  
thus multiplied by theyr tyme, muste  
be set orderly in the thyrd place of the  
figure, and in the fyrste place must be  
set the hole summe of all. .iiii. whiche  
is 31950. Now to ende the question,  
I say fyrste, yf 31950 dyd get 35145,  
what

what dyd 6690 get? Answer 7359 li.  
as by this figure appereth.

a  $\begin{array}{r} 31950 \\ 6690 \end{array} \begin{array}{r} 35145 \\ 7359 \end{array}$  Lyke wayes the se-  
cond mā had to his  
parte 7128 li. The  
thyrd must haue 6930 l. And y fourth  
man shall haue for his part 13728 li.  
as these thre figures do parcelly de-  
clare. b c

$\begin{array}{r} 31950 \\ 6480 \end{array} \begin{array}{r} 35145 \\ 7128 \end{array}$   $\begin{array}{r} 31950 \\ 6300 \end{array} \begin{array}{r} 35145 \\ 6930 \end{array}$

d

$\begin{array}{r} 31950 \\ 12480 \end{array} \begin{array}{r} 35145 \\ 13728 \end{array}$

S. This I lyke very well: but what  
profe is there of this worke? M. The  
same that I taughte you for y other.  
How be it there is vsed bothe for this  
worke and the other also this maner  
of profe, to adde all the porcyons to-  
gether, and yf they agree to the hole  
summe, then semeth it well done: but  
this is no sure rule. S. Yet 7359  
wyl I proue it in this exam 7128  
ple. The 4 pcelis are these. 6930  
whiche yf I adde together, 13728  
there



### Progression.

there wyl amount 35145, & that was the hole summe, so is this rule true here. M. And so wyl it be styll, when the worke is truely done. But yf you lyst to se it proued false, take 10000 li. fro the fourth man, and put it to any of the other 3, and then be you sure yf you haue not done well, and yet wyl that proue allowe it, for the addition wyl styll be all one. S. It must nedes be so: but what haue I now to learne? M. There are many other excellent partes behynde, of which I wyl not as now make mencion, bycause that without the knowlege of fractions, they can not duely be taught, & moch lesse vnderstande. Therfore wyl I propose to you .ii. or .iii. questions moze, wherby you maye practyse the better the feate of the rule of felowshyppe, and so make an ende for this tyme. But this maye not be forgotten, that in all suche questions, yf the monye be of diuers kyndes, you must by reduction, brynge it to one kynde, that

that is to saye, to the least valowre, & is named in the question. And lyke wayes shall you do, yf the tyme be of dyuers kyndes: as some yeares, some monethes, wekes, & dayes: you shall make all monethes, wekes, or dayes, accordyng as the least name of tyme in the questyon is. As for example, fyrst in dyuersite of monye: iii. companyons boughte 2000 shepe, & payd for them 241 li. 13 s. 4 d. of whiche summe one payd 101 li. 10 s. The secōd payde 82 li. 17 s. 10 d. And the thyrde payde 57 li. 5 s. 6 d. How many shepe must eche of them haue? Answer: The fyrst shall haue 840. The secōd 686. And the thyrde 474. And that must you worke thus: fyrste consyde- ryng that your monye is of dyuers denominatiōs, you shall (by reductiō) byngge it all into the smalest denomi- nation, whiche is in it, that is to saye pennies, and so wyl the totall summe be 58000 d. Now yf you turne eche mans monye into pēces also, the fyrst  
mans

Questiō of  
Shepe



# Progression.

mans summe wyll be 24360 d. The se-  
conde mans summe 19894 d. And the  
thyrde mans monye wyll be 13746 d.  
Now to know how many shepe euery  
man shall haue, set the hole summe of  
monye (that is 58000 d.) in the fyrste  
place: and in the seconde place set the  
number of shepe, and then orderly in  
the thyrde place set eche mans monye:  
and then multiplieng the thyrde & se-  
conde summes together, and dyuydeng  
that p amounteth, by the fyrste, there  
wyll appere the number of shepe that  
eche man ought to haue, as these thre  
figures do showe.

	a		b
58000	2000	58000	2000
24360	840	19894	686
	c		
58000	2000		
13746	474		

S. Why do you set the monye in the  
fyrste place, seyng in the question you  
say 2000 shepe cost 58000 d. and not  
thus 58000 d. coste 2000 shepe? M.  
And



And you remembre, I taught you at the begynnyng of this golden rule, that the fyrst and thyrde nōber muste be of one name, and of lyke thynges, and euer moze the nōber that the questyon is asked of, muste be set in the thyrde place. Nowe is the questyon playnly this. If 4 men bought 2000 for 58000  $\text{d}$ . how many shall eche mā haue. But sayng in this questio there ought moze respecte to be had to the sūme of monye, then to the summe of the persons (for in the summes of monye is there proportion towarde the shepe, and not in the number of persons) therfore must we turne the questyon, thus: If 58000  $\text{d}$ . boughte 2000 shepe, how many dyd 24360  $\text{d}$ . bye? Agayne, how many dyd 19894  $\text{d}$ . bye: and how many bought 13746  $\text{d}$ ? S. I perceaue it reasonable, & so shall I do in all lyke questyons. M. Euen so. But for easenes of þ worke, marke this: when so euer the fyrste & seconde number hath cyphers in theyr fyrste places,

## 412

ADMINISTRATIVE BUREAU

1000 There's hope my P.D. = 4300 B.

And this you se, is bothe the easier  
and also the more certayne waye, to  
knowe the answer to this questyon.

४३३६।९

styon here, not only how many shepe  
eche man shulde haue, but also what  
euery shepe coste. M. That questyon  
doth not onely belonge to this rule,  
but maye also be dyscussed by Dyui-  
sion, especyally yf the questyons nom-  
ber be one onely: as thus. Diuide the  
totall sūme 58000 d. by 2000 (other  
58 by 2, omittynge the cyphers) and  
the quotient wll be 29 d. that is 2 s.  
5 d. how be it, by this rule you maye  
do it, and best, when the number of y  
quotient doth excede 1: as yf I shulde  
aske this queston, 2000 shepe coste  
58000 d. how moche dyd 20 coste?  
Then shall I set my figure thus.

2000  $\overline{) 58000}$  And doyng after  
20  $\overline{) 58}$  the rule there wll

amounte 580 d. (that is 2 li. 8 s. 4 d.)  
the pryce of one shore, But yf you wyl  
vse that easy waye, that I dyd teache  
you, you may chaunge the fyrste and  
seconde number thus.

Yet now one questyon  $\overline{) 58}$   
more wll I moue (that you may per-  
ceave

Q.



### Progression.

Question

ceave the vse of all other lyke) and so make an ende. There is in a cathedrall church 20 canones, and 30 vicars, those may spende by yeare 2600 li. but every canone must haue to his parte 5 tymes so moch as every vicar hath: how moche is every mans portion, say you: S. I praye you make the aunswere your selte, so shall I perceave best the meanes to answere to suche other lyke. M. In this questiō you must do as in those that haue diuersitie of tyme, for here is diuersitie of portions. Therfore shall you multiplie the number of the persons by theyr dyfference of portion (as you dyd in the other by tyme) then must you multiplie the 20 (whiche is the nōber of canones) by 5 (for that is the nōber of theyr portiō) so wyl it be 100: then 30 (that is the nōber of vicars) by 1, (that is the number of theyr portion) and it wyl be 30: put those two summes together, and they make 130, then saye thus: If 130 spende 2600 li. what

what maye 100 spende? The rule  
showeth 2000 li. Agayne for the by-  
cates: Yf 130 spende 2600 li., what  
maye 30 spende? Answer, 600 li. as  
these figures shewe.

$$\begin{array}{r} 130 \quad 2600 \\ 100 \quad 2000 \end{array}$$

$$\begin{array}{r} 130 \quad 2600 \\ 30 \quad 600 \end{array}$$

But yf euery cānone shulde haue so  
often tymes 4 li. as the bycare shuld  
haue 3 li. then shulde I multiply 20  
by 4 (that were 80) and 30 by 3 (that  
were 90) and then bothe were 170.

Then shulde the figures be set thus.

li. s. d

li. s. d

$$\begin{array}{r} 170 \quad 2600 \\ 80 \quad 1232, 16, 7 \end{array}$$

$$\begin{array}{r} 170 \quad 2600 \\ 90 \quad 1376, 9, 5 \end{array}$$

But this sorte is to harde for you by  
reason of the fractiōs, therfore I wyl  
let it reste to that place. And by this  
rule you se what the 20 cānons maye  
spende, whiche sūme yf you diuide by  
20, you shall se eche cānons portion,  
and so of y bicars, yf you diuide theyr  
sūme by 30, the quotient wyl declare  
euery bicars portion.

Q.ii.

The

Accomptynge  
**T**he seconde dialoge  
of accomptynge by  
counters.

Mayster



Owe that you have  
learned the commen  
kyndes of Arithme-  
tyke with the penne,  
you shall se the same  
arte in counters: whi-  
che feate doth not only serue for them  
that can not write and rede, but also  
for them that can do bothe, but haue  
not at some tymes theyr penne or ta-  
bles redye with them. This sorte is in  
two fourmes comenly. The one by ly-  
nes, and the other without lynes: in  
that þ hath lynes, the lynes do stande  
for the order of places: and in þ that  
hath no lynes, there muste be sette in  
theyr stede so many counters as shall  
nede, for eche lyne one, and they shall  
supplie the stede of the lynes. S. By  
examples I shuld better pceaue your  
meanynge. M. For example of the ly-  
nes



nes: Lo here you se . vii. lynes whiche  
 stande for syre  
 places, so that  
 the nethermost  
 standeth for  $\text{v}$   
 fyrst place, and  
 the next aboue  
 it, for the second: and so byward tyll

—100000—

—10000—

\*1000—

—100—

—10—

—1—

you come to the hyghest, which is the  
 fyrte lyne, and standeth for the fyrte  
 place. Now what is the valewe of e-  
 uery place or lyne, you may perceave  
 by the figures whiche I haue set on  
 them, whiche is accordynge as you  
 learned befoze in the Numeration of  
 figures by the penne: for the fyrste  
 place is the place of vnities or ones,  
 and euery counter set in that lyne be-  
 tokeneth but one: & the seconde lyne  
 is the place of 10, for euery counter  
 there, standeth for 10. The thyrde lyne  
 the place of hundzedes: the fourth of  
 thousandes: & so forth. S. Sye I do  
 perceave that the same order is here  
 of lynes, as was in the other figures

Numeration.

# Accompryng

by places, so that you shall not nede longer to stande about Numeration, excepte there be any other difference.

M. If you do vnderstāde it, then how wll you set 1543? S. Thus,

as I suppose. M. You haue set 5 places truely, but your figures be not mete for this vse; for the metest figure in

this behalfe, is the figure of a counter round, as you se here,

wherc I haue expres- sed that same summe.

S. So that you haue not one figure for 2,

nor 3, nor 4, and so forth, but as many digettes as you haue, you set in the lowest lyne: and for euery 10 you set one in the second line: and so of other.

But I know not by what reason you set that one counter for 500 betwene two lynes. M. you shall remember this, that when so euer you nede to set downe 5, 50, or 500, or 5000, or so forth any other number, whose numeratoz

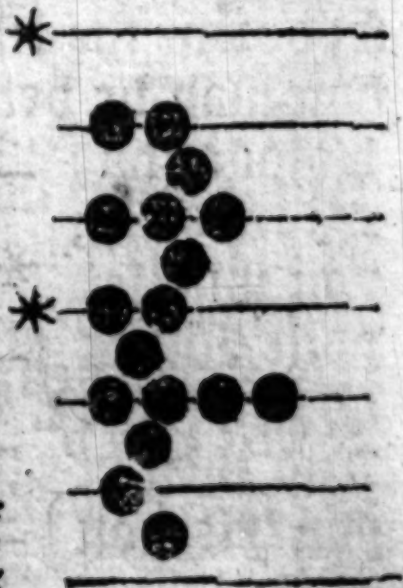
is 5,

by counters.

118

is 5, you shall set one counter for it, in the nexte space aboue the lyne that it hath his denomination of, as in this example of that 500, bycause the numerator is 5, it must be set in a voyd space: and bycause the denominator is hundred, I knowe that his place is the voyde space nexte aboue hundredes, that is to say, aboue the thyrde lyne. And farther you shall marke, that in all workynge by this sorte, yf you shall sette downe any summe betwene 4 and 10, for the fyrste parte of that number you shall set downe 5, & then so many counters more, as there reste nōbers aboue 5. And this is true bothe of Digettes

and articles. And for example I wyll set downe this sūme 287265, which sūme yf you marke well, you nede none other exāples for to lerne the numeration of this

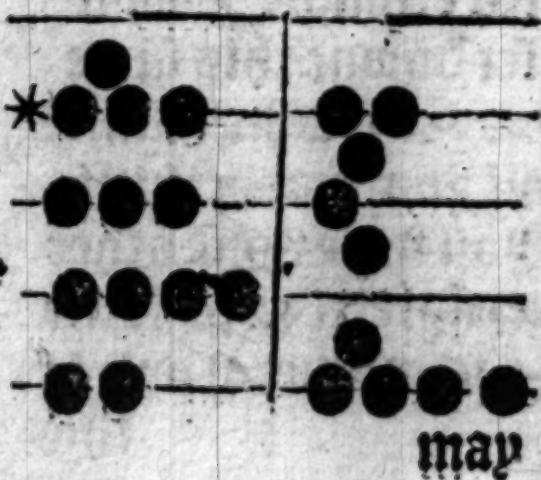




# Accomptynge

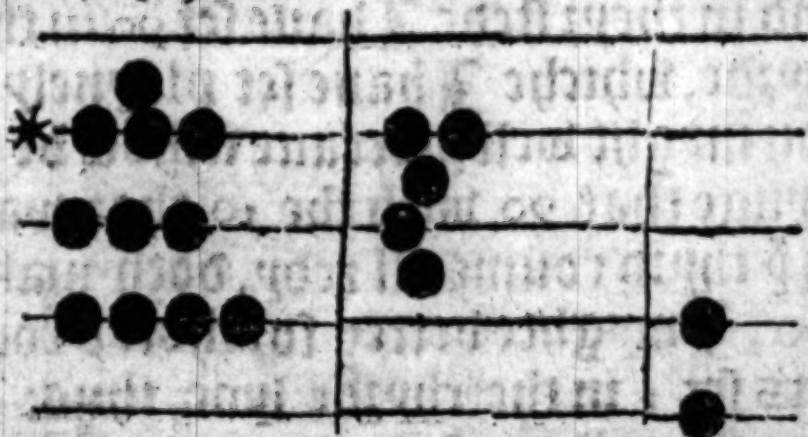
this forme. But this shal you marke, that as you dyd in the other kynde of arithmetike, set a picke in the places of thousandes, in this worke you shall sette a starre, as you se here. S. Then I perceauie numeration, but I praye you, howe shall I do in this arte to adde two summes or moze together? M. The easiest way in this arte is, to adde but 2 sūmes at ones together: how be it you maye adde moze, as I wyll tell you anone. Therfoze when you wyll adde two sūmes, you shall fyrst set downe one of them, it fo:seth not whiche, & then by it drawe a lyne crosse the other lynes. And afterward set downe the other sūme, so that that lyne may be betwene them, as yf you wolde adde

2659 to 8342,  
you must set  
your sūmes  
as you se here.  
And then yf  
you lyst, you



Subtra  
ction

may adde the one to the other in the same place, or els you may adde them both together in a newe place: which waye, bycause it is moste playnest, I wyl shewe you fyrst. Therfore wyl I begynne at the vnites, whiche in the fyrst sūme is but 2, & in y<sup>e</sup> second sūme 9, that maketh 11, those do I take vp, and for them I set 11 in the newe rōume, thus.

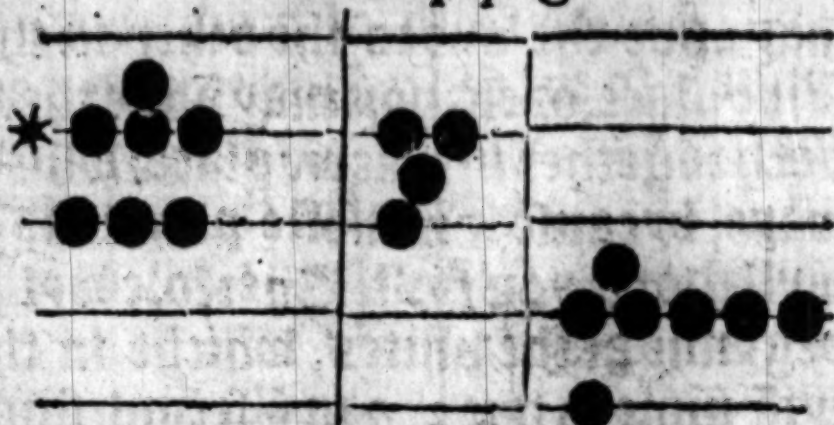


Then do I take vp all y<sup>e</sup> articles vnder a hundred, which in the fyrst sūme are 40, and in the seconde sūme 50, that maketh 90: or you may saye better, that in the fyrste sūme there are 4 articles of 10, and in the seconde sūme 5, whiche make 9, but then take hede that you sette them in theyr

Q.v.

ryght

# Accomptynge



ryght lynes, as you se here.

Where I haue taken awaye 40 fro  
the fyrste sume, and 50 from þe second,  
and in theyr stede I haue set 90 in the  
thyrde, whiche I haue set playnely þe  
you myght well perceaue it: how be it  
seyng that 90 with the 10 that was  
in þe thyrde rounge all redy, doth make  
100, I myghte better for those 6 cou-  
ters set 1 in the thyrde lyne, thus:

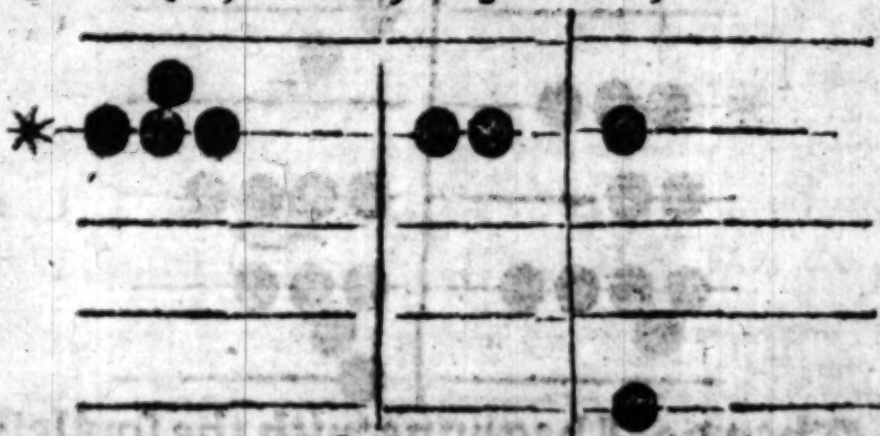
For it is all one summe  
as you may se, but it is  
beste, neuer to set 5 cou-  
ters in any line, for that  
may be done with 1 cou-



ter in a hygher place. S. I iudge that  
good reaso, for many are vnnedefull,  
where one wll serue. M. Well, then  
wll



wyll I adde forth of hundzedes: I fynde 3 in the fyfste summe, and 6 in the seconde, whiche make 900, then do I take vp & set in the thyrde rounne where is one hundzed all redy, to whiche I put 900, and it wyll be 1000, therfore I set one couiter in the fourth lyne for them all, as you se here.



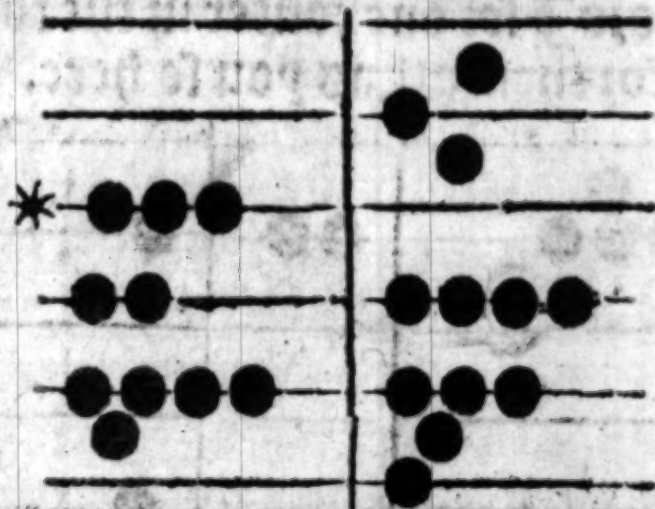
Then adde I þ thousandes together, whiche in the fyfste summe are 8000, & in þ second 2000, that maketh 10000: them do I take vp fro those two places, and for them I set one counter in the fyfste lyne, and then appereth as you se, to be 11001, for so many doth amount of the addition of 8342 to 2659.



S.

## Accomptynge

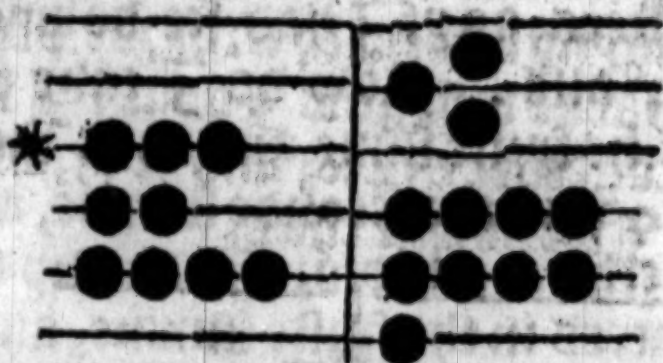
S. **S**y, this I do perceave: but how  
 Shall I set one sūme to an other, not  
 chaungynge them to a thyrde place?  
 M. Marke well how I do it: I wyl  
 adde together 65436, and 3245, which  
 fyrste I set downe thus.



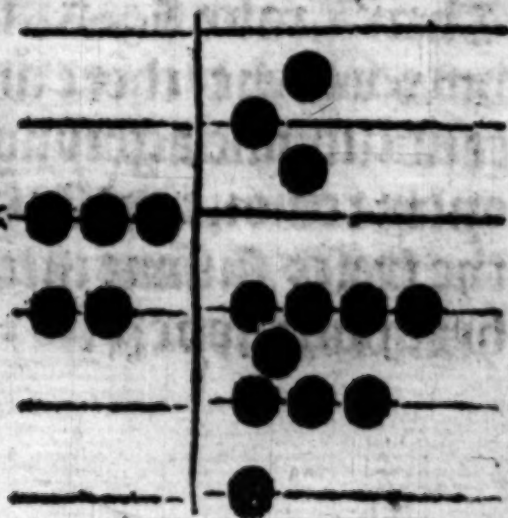
Then do I begynne with the smalest,  
 which in the fyrst summe is 5, that do  
 I take vp, and wold put to the ocher  
 5 in the seconde summe, saynge that  
 two counters can not be set in a voyd  
 place of 5, but for them bothe I must  
 set 1 in the seconde lyne, which is the  
 place of 10, therfore I take vp the 5  
 of the fyrst sūme, & the 5 of the secōde,  
 and for them I set 1 in the secōd lyne,  
 as

by counters.  
as you se here.

121

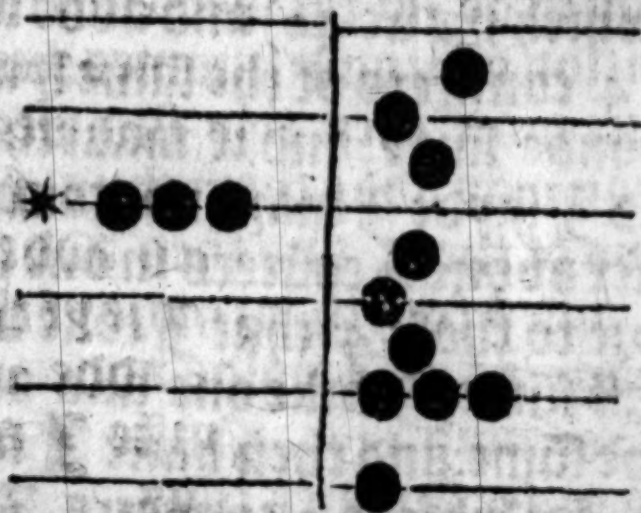


Then do I lyke wayes take vp the 4  
counters of the fyrste sūme & seconde  
lyne (which make 40) and adde them  
to the 4 counters of the same lyne, in  
the seconde sūme, and it maketh 80,  
But as I sayde I maye not conuent-  
ently set aboue 4 cōuters in one lyne,  
therfoze to those 4 that I toke vp in  
the fyrst sūme, I take one also of the  
seconde sūme, and then haue I taken  
vp 50, for whiche 5 counters I sette  
downe one in  
the space ouer  
þe second lyne,  
as here dothe \*  
appere.





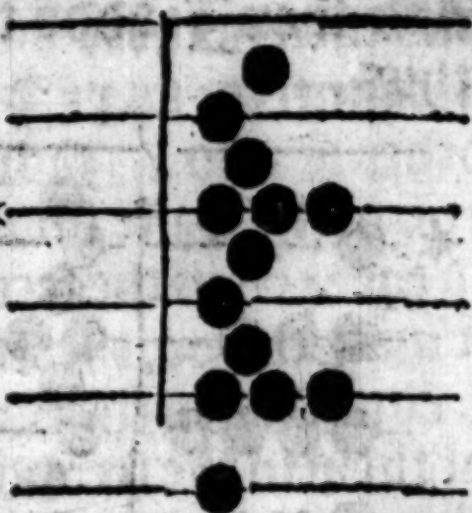
Accomprynge  
 and then is there 80, as well w those  
 4 counters, as yf I had set downe y  
 other 4 also. Now do I take the  
 200 in the fyrste sūme, and adde them  
 to the 400 in the seconde summe, and  
 it maketh 600, therfore I take vp the  
 2 counters in the fyrste summe, and 3  
 of them in the seconde summe, and for  
 them 5 I set 1 in yspace aboue, thus.



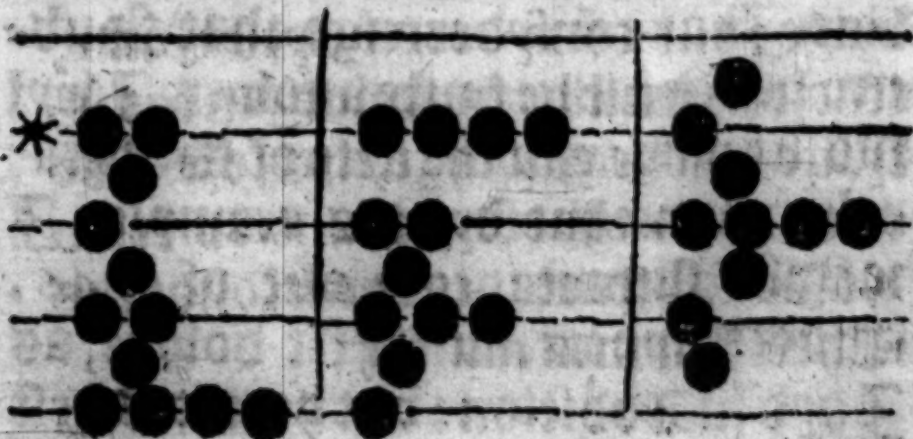
Then I take y 3000 in y fyrste sūme,  
 vnto whiche there are none in the se-  
 cond summe agreynge, therfore I do  
 onely remoue those 3 counters from  
 the fyrste summe into the seconde, as  
 here doth appere.

And

And so you see  
the hole sūme,  
that amoūteth  
of the addytiō \*  
of 65436 with  
3245, to be 6868  
And yf you ha-  
ue marked the-  
se two exāples



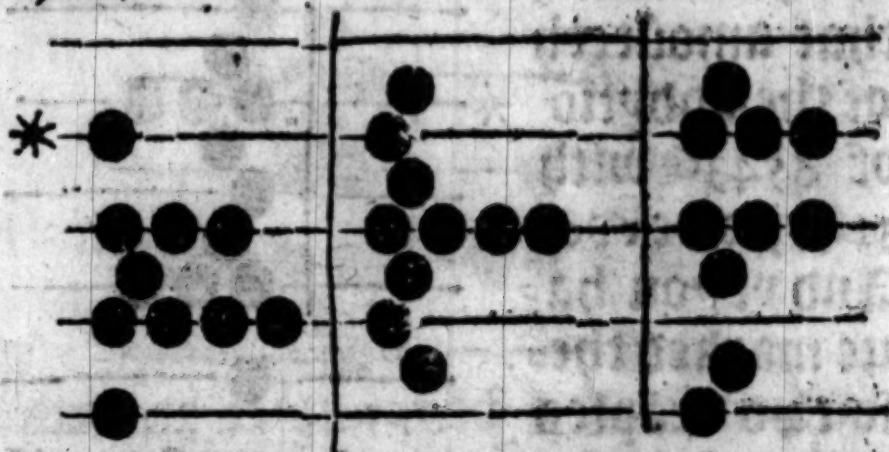
well, you nede no farther enstructiō  
in Addition of 2 only summes: but yf  
you haue moze then two summes to  
adde, you may adde them thus. Fyſt  
adde two of them, and then adde the  
thyrde, and þ fourth, or moze yf there  
be so many: as yf I wolde adde 2679  
with 4286 and 1391. Fyſte I adde  
the two fyſte summes thus.



And

## Accomptynge

And then I adde the thyrde thereto thus.



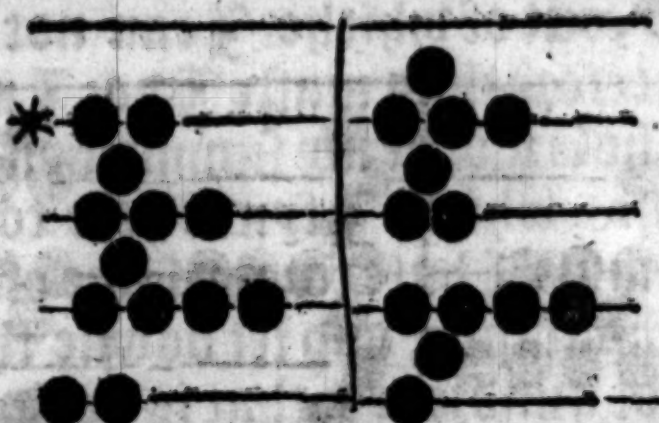
And so of more yf you haue them. S. Nowe I thynke beste that you passe forth to Subtraction, except there be any wayes to examyn this maner of Addition, then I thynke that were good to be knowen nexte. M. There is the same p[ro]ofe here that is in the o[th]er Addition by the penne, I meane Subtraction, for that onely is a sure waye: but consyde[re]yng that Subtraction must be fyrste knowen, I wyl fyrste teache you the arte of Subtraction, and that by this example: I wolde substracte 2892 out of 9746. These summes must I set downe, as I dyd in Addition: but here it is best to set



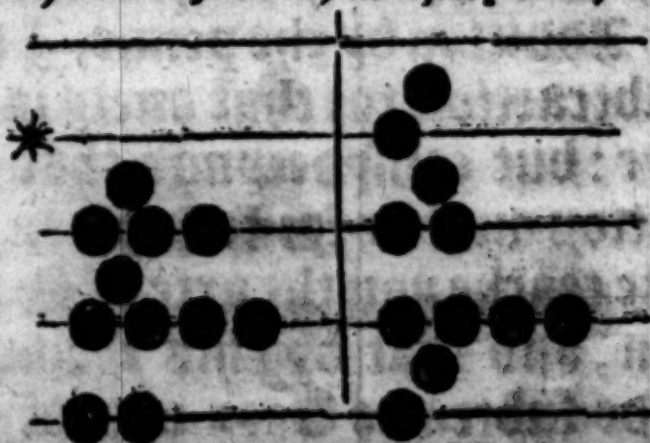
by counters.

116

to set the lesser nōber fyrste, thus,



Then shall I begynne to subtracte the greatest nombꝛes fyrste (contrary to the vse of the penne) & is the thousandes in this exāple:therfoze I fynd amongst the thousandes 2,foz which I withdraue so many frō the seconde summe (where are 8) and so remayneth there 6, as this exāple showeth,



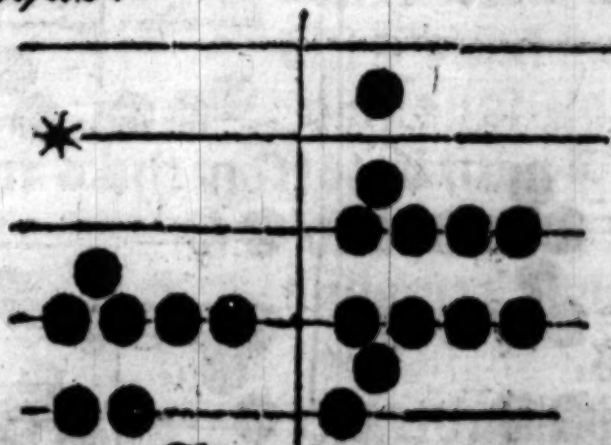
Then do I lyke wayes with the hundredes, of whiche in the fyrste summe

18.

I

# Accomtyng

I fynde 8, and is the seconde summe but 7, out of whiche I can not take 8, therfoze thus muste I do: I muste loke how moche my summe dyffereth from 10, whiche I fynde here to be 2, then must I bate for my sūme of 800, one thousande, and set downe the ex- cesse of hundzedes, that is to saye 2, for so moche 100 is moze then I shuld take vp. Therfoze fro the fyrste sūme I take that 800, and from the second sūme where are 6000, I take vp one thousande, and leue 5000: but then set I downe the 200 vnto the 700 þ are there all redye, and make them 900 thus.



Then come I to the articles of tēnes,  
where in the fyrste sūme I fynde 90,  
and

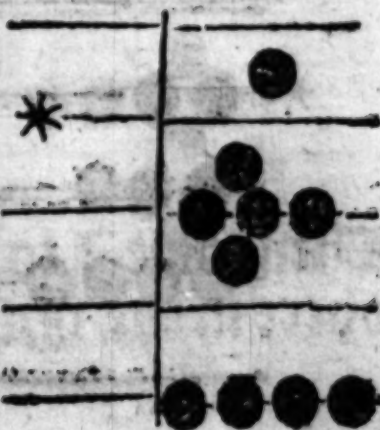
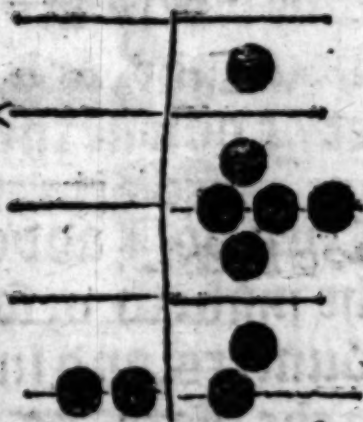
And in the seconde summe but only 40:  
 Now consydering that 90 can not be  
 bated from 40, I loke how moche  $\bar{p}$   
 90 doth dyffer from the nexte summe  
 aboue it, that is 100 (or elles whiche  
 is all to one effecte, I loke how moch  
 9 doth dyffer fro 10) & I fynd it to be  
 1, then in the stede of that 90, I do  
 take from the second summe 100: but  
 consyderynge that it is 10 to moche,  
 I set downe 1 in  $\bar{p}$  nexte lyne beneth  
 for it, as you se here.

Saupnge that here  
 I haue set one coun  
 ter in  $\bar{p}$  space in stede  
 of 5 in  $\bar{p}$  nexte lyne.

And thus haue I sub  
 tracted all saue two,  
 whiche I must bate from the 6 in the  
 seconde summe, and  
 there wyl remayne  
 4, thus.

So  $\bar{p}$   $\bar{p}$  I subtracte  
 2892 fro 8746, the re  
 mayner wyl be 5854,

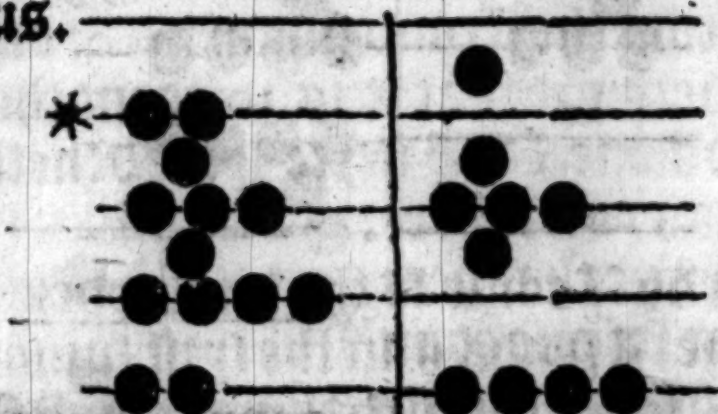
R. II. And



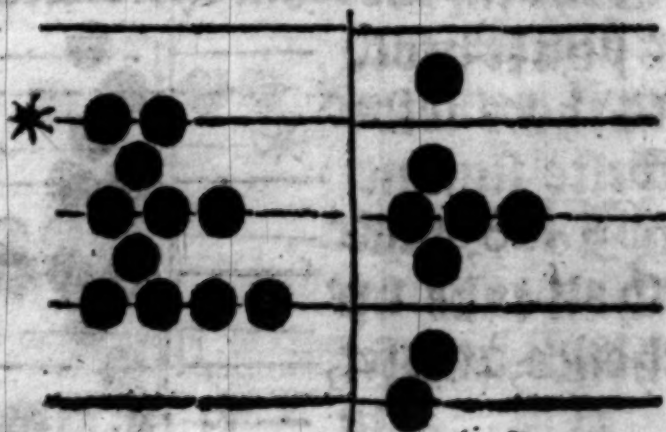


## Accomtynge

And that this is truely wrought, you maye proue by Addition: for yf you adde to this remayner the same sūme that you dyd subtracte, then wyl the former sūme 8746 amount agayne. S. That wyl I proue: and fyrst I set the sūme that was subtracted, which was 2892, & then the remayner 5854, thus.



Then do I adde fyrst 2 to 4, whiche maketh 6, so take I vp 5 of those counters, and in theyr stede I sette 1 in the space, as here appereth.

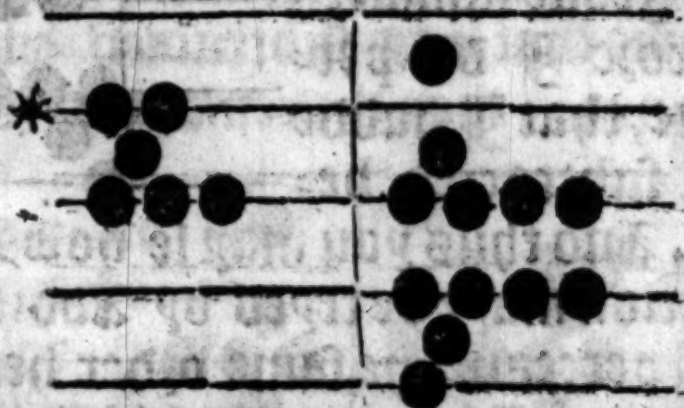


Then

by counters.

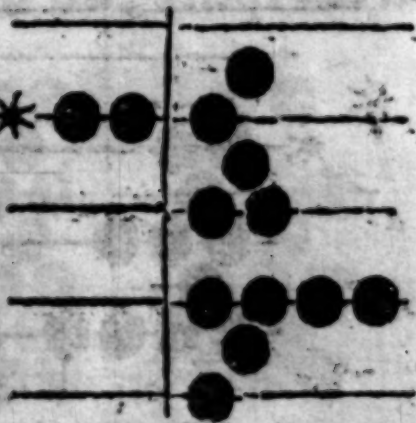
118

Then do I adde the 90 nexte above to the 50, and it maketh 140, therfore I take vp those 6 counters, and for them I sette 1 to the hundzedes in þe thyrde lyne, & 4 in þe second lyne, thus.



Then do I come to the hundzedes, of whiche I fynde 8 in the fyrst summe, and 9 in þe second, that maketh 1700, therfore I take vp those 9 counters, and in theyr stede I sette 1 in the.iiii. lyne, and 1 in the space nexte beneth, and 2 in the thyrde lyne, as you se here.

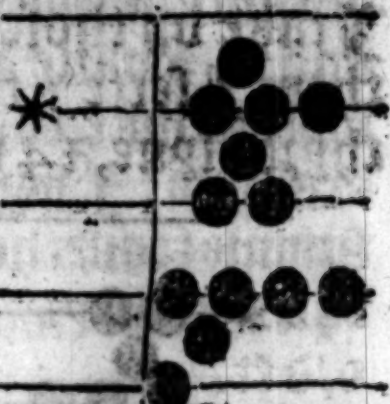
Then is there lefte in the fyrste summe but only 2000, whiche I shall take vp from thence, and set



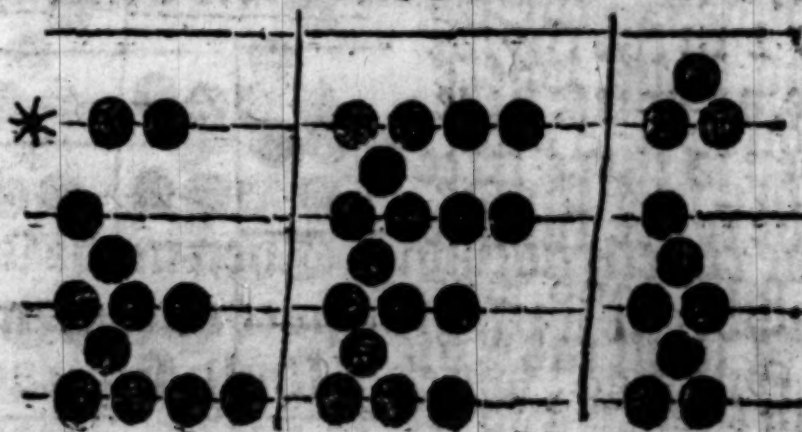
R.iii. in the

## Accomptynge

In the same lyne in þe second sūme, to þe  
one þe is there all redy: & then wyl the  
hole sūme appere (as  
you may wel se) to be  
8746, which was þe  
fyrst grosse summe, &  
therfore I do per-  
ceave, that I hadde  
well subitracted be-



fore. And thus you may se how Sub-  
traction maye be tryed by Addition.  
S. I perceave the same order here w  
couters, þe I lerned before in figures.  
M. Then let me se howe can you trye  
Addition by Subtraction. S. I fynde  
I wyl set forth this exāple of Additiō  
where I have added 2189 to 4988, &  
the hole sūme appereth to be 7177.



Now



Nowe to trye whether that sūme be well added or no, I wyl subtract one of the fyrst two sūmes from the thyrde, and yf I haue well done þ remayner wyl be lyke that other sūme. As for example: I wyl subtracte the fyrste summe from the thyrde, whiche I set thus in theyr

order.

Then do I subtract 2000 of the fyrste summe frō þ second sūme, and then remayneth there 5000 thus.

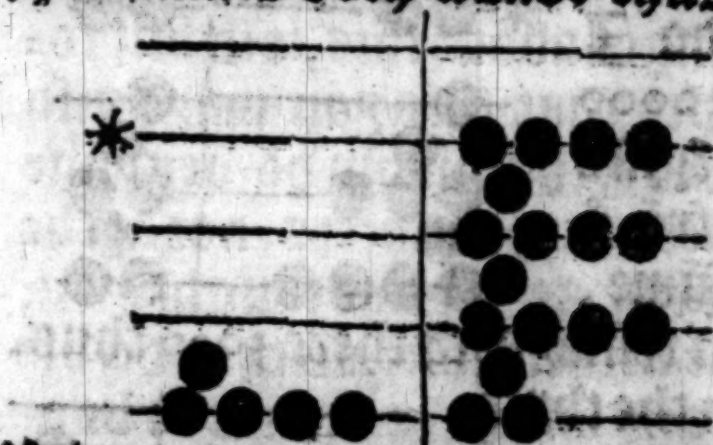
Then in the thyrde lyne, I subtract þ 100 of the fyrste summe, frō the second sūme, where is onely 100 also, & then in þ thyrde lyne resteth nothyng. Then in the seconde lyne with his space ouer hym, I fynde 80, which I shuld subtract

R.iiii.

from

## Accomptynge

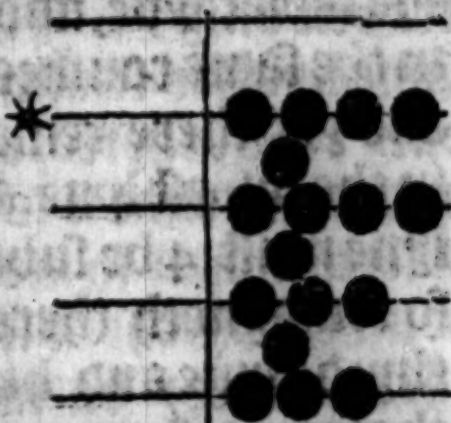
from the other summe, then seying there are but only 70 I must take it out of some hygher summe, whiche is here only 5000, therfore I take vp 5000, and seying that it is to moch by 4920, I sette downe so many in the seconde rowme, whiche with the 70 beyng there all redy do make 4990, & then the summes doth stande thus.



Yet remayneth there in the fyrst summe 9, to be bated from the second summe, where in that place of vnities dothe appere only 7, then I muste bate a hygher summe, that is to saye 10, but seyinge that 10 is moze then 9 (whiche I mulde abate) by 1, therfore shall I take vp one counter from the seconde lyne, & set downe the same in the fyrst

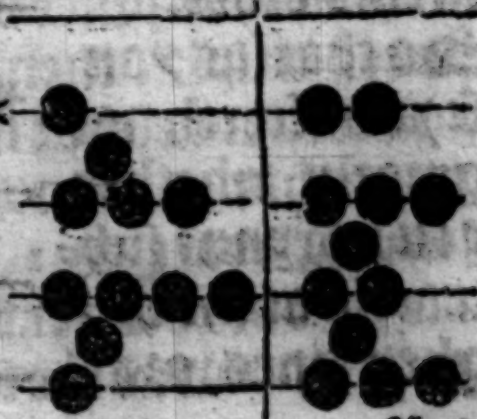
oz lowest lyne, as you se here.

And so haue I ended this worke, & the summe appereth to be  $\text{p}$  same, whiche was  $\text{p}$  seconde summe of my addition, and therfoze



I perceauie, I haue wel done. M. To stande longer about this, it is but folye: excepte that this you maye also vnderstande, that many do begynne to subtracte with counters, not at the hyghest summe, as I haue taught you, but at the nethermoste, as they do vse to adde: and when the summe to be abated, in any lyne appeareth greater then the other, then do they borowe one of the nexte

hygher rounge, as for example: if they shuld abate 1846 from 2378, they set  $\text{p}$  summes thus.



B. v.

And



## Accomptynge

And fyrste they take 6 whiche is in the lower lyne, and his space from 8 in the same rounes, in þe second sūme, and yet there remayneth 2 counters in the lowest lyne. Then in the second lyne must 4 be subtracte from 7, and so remayneth there 3. Then 8 in the thyrde lyne and his space, from 3 of the second summe can not be, therfore do they bate it from a hygher rounne, that is, from 1000, and bycause that 1000 is to moch by 200, therfore must I sette downe 200 in the thyrde lyne, after I haue taken by 1000 from the fourth lyne: then is there yet 1000 in the fourth lyne of the fyrst sūme, whiche yf I withdraue from the seconde summe, then doth all þe figures stande in this order.

So that (as you se) it differeth not greatly whether you begynne subtractiō at the hygher lynes, or at



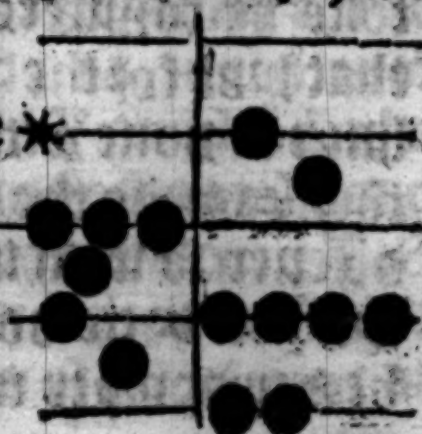
the

the lower. Now be it, as some menne  
 lyke the one waye beste, so some lyke  
 the other: therfore you now knowyng  
 bothe, may vse whiche you lyst. But  
 nowe touchyng **Multiplicatio**: you **Multiplic**  
 shall set your nōbers in two rounes, **caryon**  
 as you dyd in those two other kyndes  
 but so that the multiplier be set in the  
 fyrste rounge. Then shall you begyn  
 with the hyghest nōbers of y seconde  
 rounge, and multiply them fyrst after  
 this sort. Take that ouermost lyne in  
 your fyrst workyng, as yf it were the  
 lowest lyne, settyng on it some moua-  
 ble marke, as you lyst, and loke how  
 many counters be in hym, take them  
 vp, and for them set downe the hole  
 multiplier, so many tymes as you  
 toke vp counters, reckenyng, I saye  
 that lyne for the vnites: & when you  
 haue so done with the hyghest nōber  
 then come to the nexte lyne beneth, &  
 do euen so with it, and so with y next,  
 tyll you haue done all. And yf there  
 be any number in a space, then for it  
 shall



## Accomptynge

Shall you take þ multiplier 5 tymes,  
 and then muste you reckon that lyne  
 for the vnites whiche is nexte beneth  
 that space: or els after a shorter way,  
 you shall take only halfe the multy-  
 plyer, but then shall you take the lyne  
 nexte aboue that space, for the lyne of  
 vnites: but in suche workynge, if  
 chaunce your multyplyer be an odde  
 nomber, so that you cannot take the  
 halfe of it iustly, then muste you take  
 the greater halfe, and set downe that,  
 as if that it were the iuste halfe, and  
 farther you shall set one counter in the  
 space beneth that line, which you rec-  
 ken for the lyne of vnities, or els only  
 remoue forward the same that is to  
 be multyplyed. S. If you set forth an  
 example hereto. I  
 thynke I shall per-  
 ceauie you. M. Tak<sup>e</sup>  
 this exāple: I wold  
 multiply 1542 by  
 365, therefore I set þ  
 numbers thus.



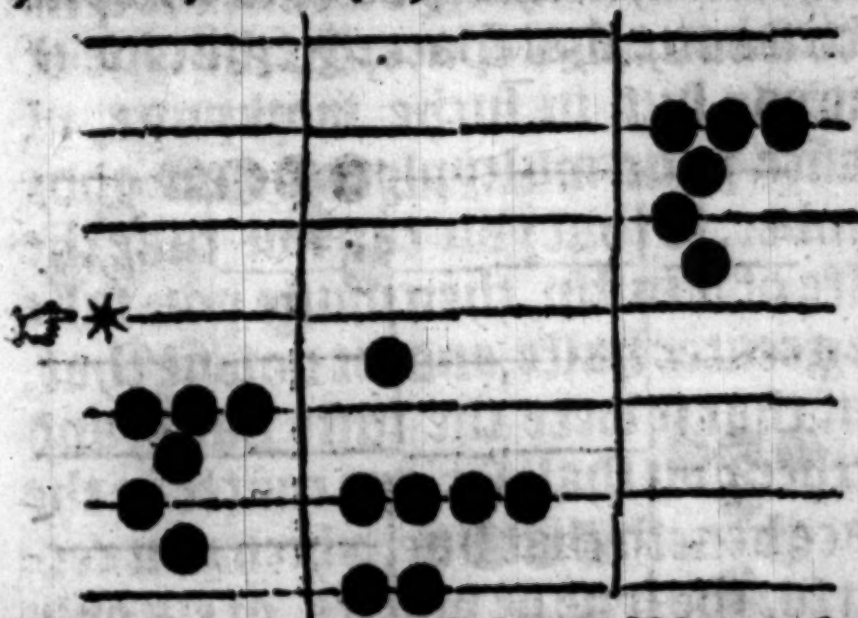
Then



by counters.

122

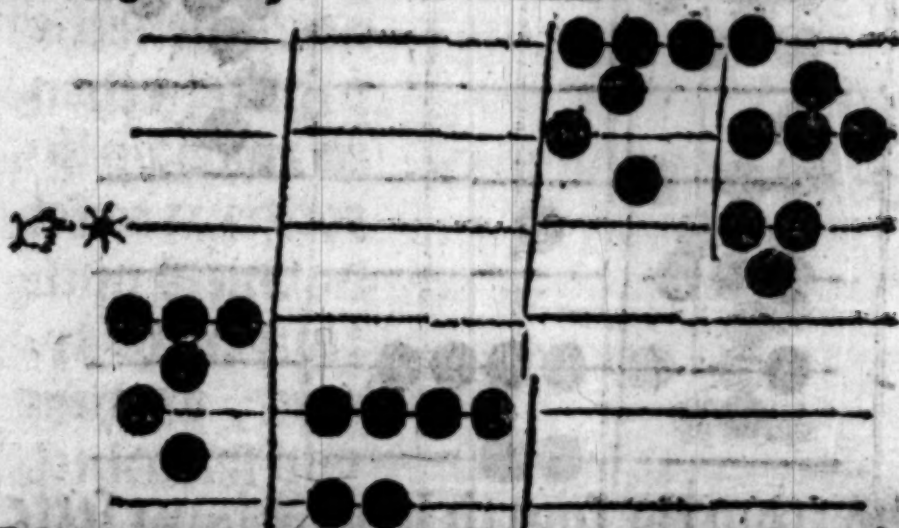
Then fyrste I begynne at the 1000 in  
 þe hyghest rounne, as yf it were þe fyrst  
 place, & I take it bp, settyng downe  
 for it so often (that is ones) the mul-  
 typlier, which is 365, thus, as you se  
 here: where for the one counter taken



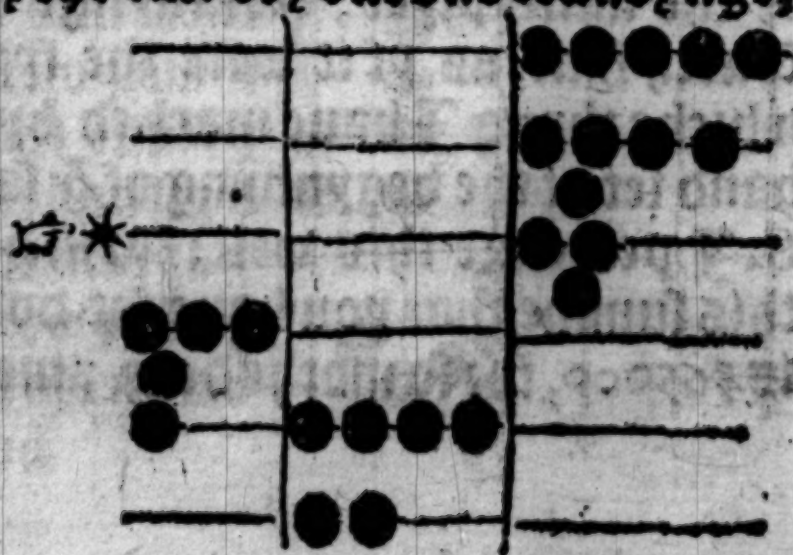
bp from the fourth lyne, I haue sette  
 downe other 6, whiche make þe sūme  
 of the multiplyer, rekenyng that  
 fourth lyne, as yf it were the fyrst:  
 whiche thyng I haue marked by the  
 hand set at the begynnynge of þe same,  
 S. I perceaue this well: for in dede,  
 this summe that you haue set downe  
 is 365000, for so moche doth amount  
 of

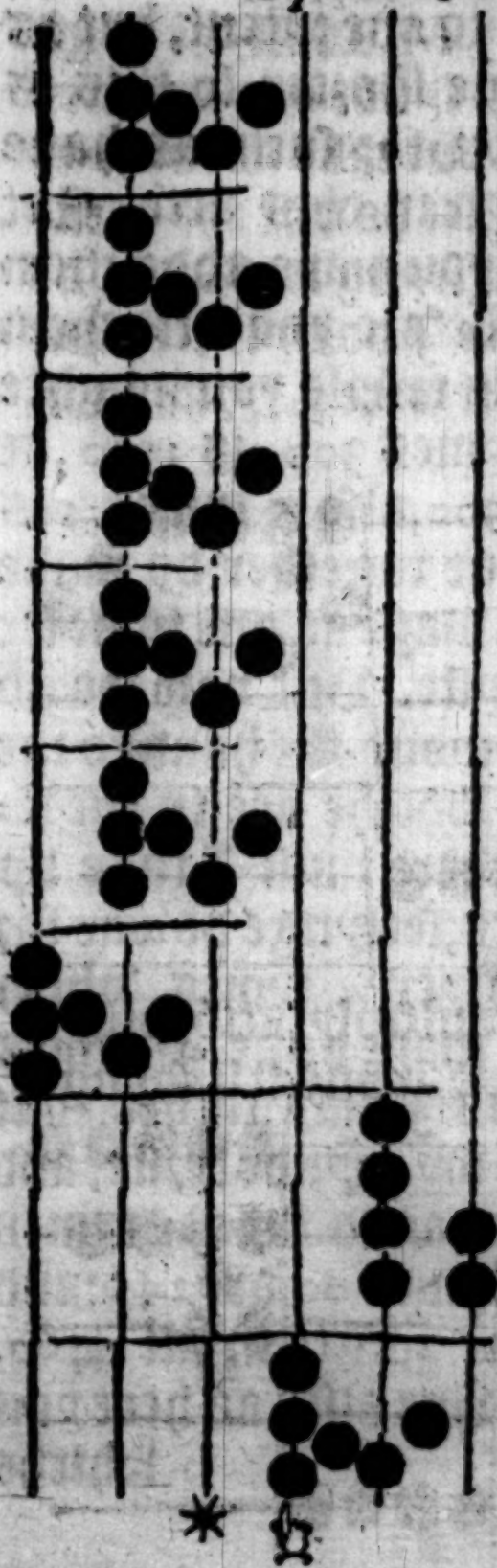
# Accomptynge

of 1000, multiplýed by 365. M. Well thē to go  
 Forth, in the nexte space I fynde one counter  
 which I remoue forward but take not vp, but  
 do (as in such case I must) set downe the grea-  
 ter halfe of my multiplier (seyng it is an odde  
 nōber) which is 182, & here I do styll let that  
 fourth place stand, as yf it were þ̄ fyrst: as in  
 this fourme you se,



where I haue set this multiplýcatiō with þ̄  
 other: but for the ease of your vnderstādyng,  
 I haue set  
 a lytell ly-  
 ne betwene  
 them: now  
 shulde they  
 both in one  
 sūme stand  
 thus.





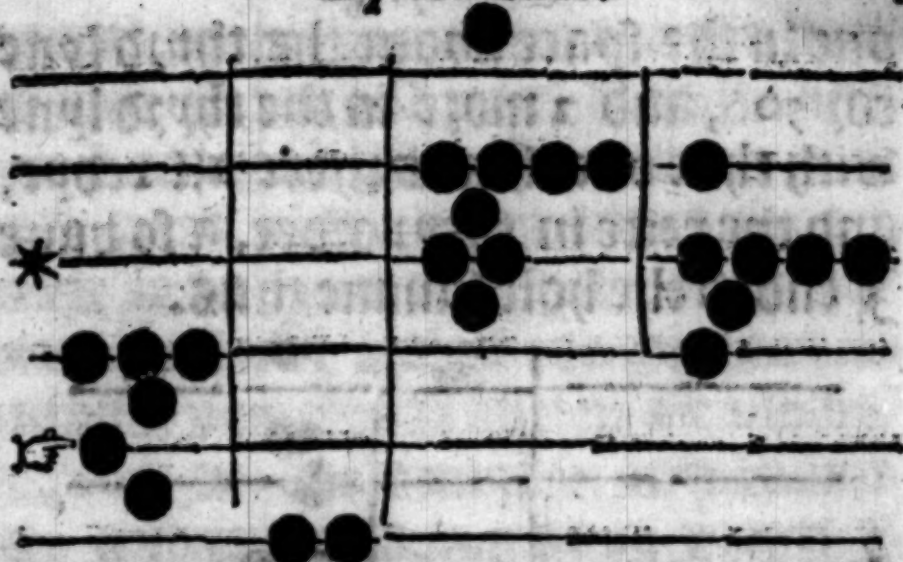
Howe be it an  
 other fourme  
 to multyplye  
 suche counters  
 i space is this:  
 fyrst to remo-  
 ue the fyn-  
 ger to the lyne  
 nexte benethe  
 þ space, & then  
 to take vp þ  
 coūter, & to set  
 downe þ mul-  
 tiplier. v. ty-  
 mes, as here  
 you se. Which  
 sūmes yf you  
 do adde toge-  
 ther into one  
 sūme, you shal  
 pceaue that it  
 wyl be þ same  
 þ appeareth of  
 þ other workig  
 befoze, so that  
 bothe



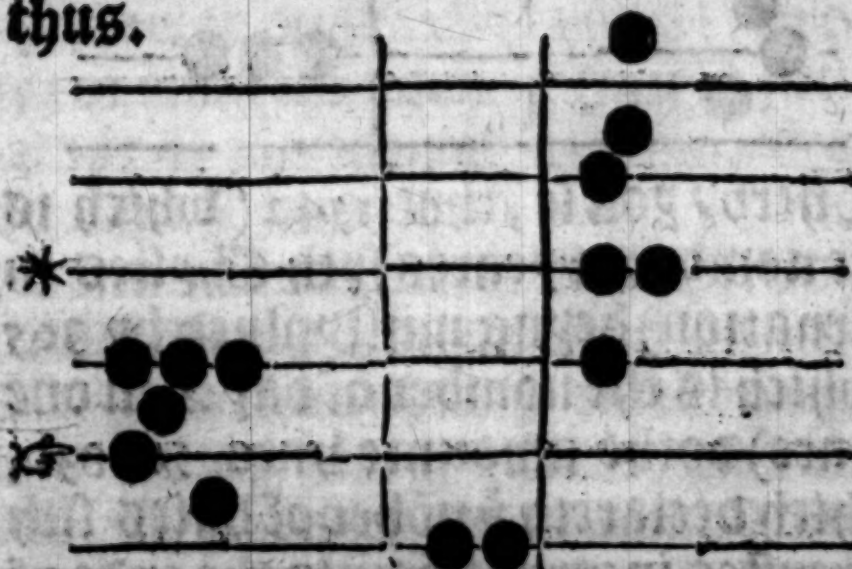
### Accomptynge

bothe sortes are to one entent, but as the other is moze chopter, so this is playner to reason, for suche as haue had small exercyse in this arte. Not withstandynge you maye adde them in your mynde befoze you sette them downe, as in this exāple, you myghte haue sayde 5 tymes 300 is 1500, & 5 tymes 60 is 300, also 5 tymes 5 is 25, whiche all put together do make 1825, which you maye at one tyme set downe yf you lyst. But nowe to go forth, I must remoue the hand to the nexte counters, whiche are in the second lyne, and there must I take vp those 4 counters, settinge downe for them my multipler 4 tymes, which thyng other I maye do at 4 tymes seuerally, or elles I may gather that hole summe in my mynde fyrste, and then set it downe: as to saye 4 tymes 300 is 1200: 4 tymes 60 are 240: and 4 tymes 5 make 20: þ is in all 1460, þ shall I set downe also, as here you se.

whiche



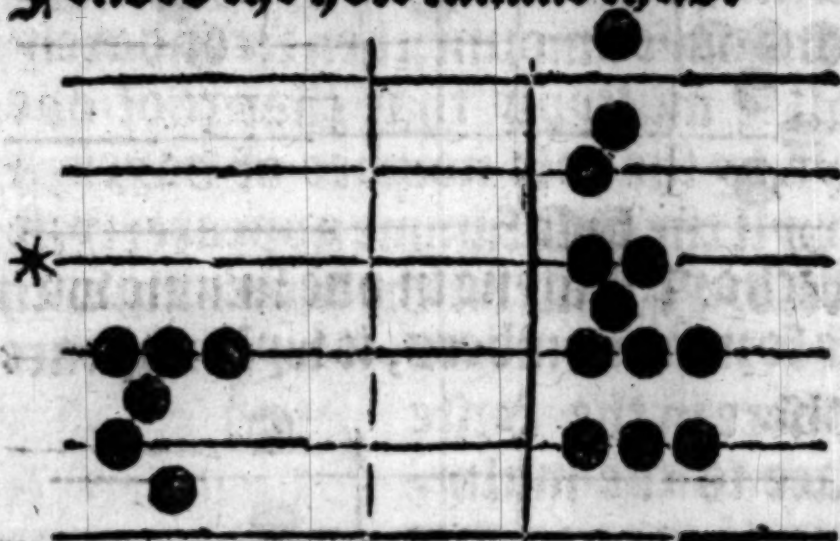
whiche yf I toyne in one summe with  
the former numbers, it wyl appear  
thus.



Then to ende this multiplicatton, I  
remoue the synger to the lowest lyne,  
where are onely 2, then do I take  
bp, and in theyr stede do I set downe  
twyse 365, that is 730, for which I set  
S. one

## Accomtynge

one in the space aboue the thyr<sup>d</sup> lyne  
for 500, and 2 more in the thyr<sup>d</sup> lyne  
with that one that is there all redye,  
and the reste in they<sup>r</sup> order, & so haue  
I ended the hole summe thus.



Wherby you se, that 1542 (which is  
the number of yeares syth Chystes in  
carnation) beyng multiplyed by 365  
(which is the number of dayes in one  
yeare) dothe amounte vnto 562830,  
which declareth y<sup>e</sup> nōber of daies sith  
Chystes incarnatiō vnto the ende of  
1342 yeares. (besyde 385 dayes and 12  
houres for lepe yeares) S. Now wyll  
I p<sup>r</sup>oue by an other exāple, as this:  
40 labourers (after 6 d. y<sup>e</sup> day for eche  
man) haue wrought 29 dayes, I wold  
know



by counters.

125

know what they? wages doth amount  
unto: In this case muste I worke  
doublely: fyrst I must multiplye the  
number of the labourers by  $\bar{p}$  wages  
of a man for one day, so wyl  $\bar{p}$  charge  
of one daye amount: then secundarely  
shall I multiply that charge of one  
daye, by the hole number of dayes, &  
so wyl the hole summe appeare: fyrst  
therfore I shall set the sumes thus.

Where in the fyrste  
space is the multiply-  
plyer ( $\bar{p}$  is one dayes  
wages for one man)

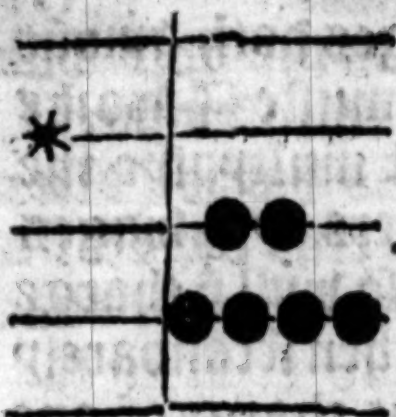
& in the second space  
is set the number of

the worke men to be multiplyed: the  
saye I, 6 tymes 4 (reckenyng that  
second lyne as the lyne of vnites) ma-  
keth 24, for whiche summe I shulde  
set 2 counters in the thyrde lyne, and  
4 in the seconde, therfore do I set 2  
in the thyrde lyne, and let the 4 stand  
styll in the seconde lyne, thus.

S.ii.

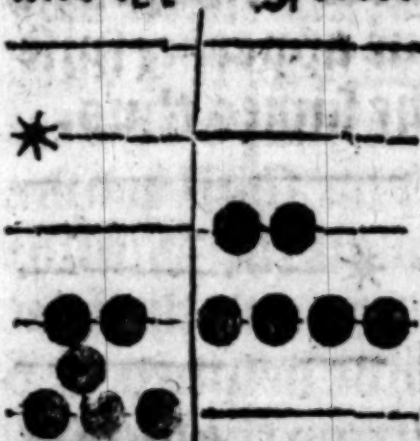
So

# Accomtynge



So answereth the  
hole dayes wages  
to be 240 d. that  
is 20 s. Then do  
I multiply agayn  
the same summe by  
the nōber of dayes

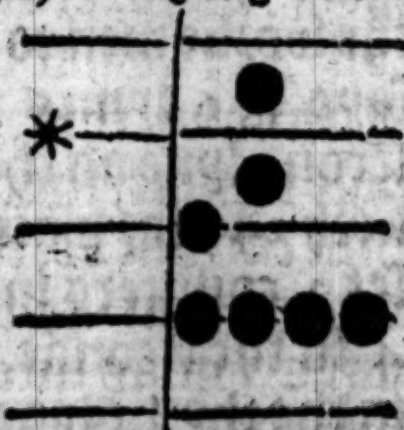
and fyrste I sette the numbers, thus.



Thē bycause there  
are counters in dy-  
uers lynes, I shall  
begynne with the  
hyghest, and take  
them bp, settinge  
for them the mul-

typlyer so many tymes, as I toke bp  
counters, & is twyse, then wyl p sūme  
stande thus.

Then come I to p  
seconde lyne, and  
take bp those 4 cou-  
ters, settinge for  
them the multiply-  
er foure tymes, so



wyl the hole summe appeare thus.

So is

by counters.

126



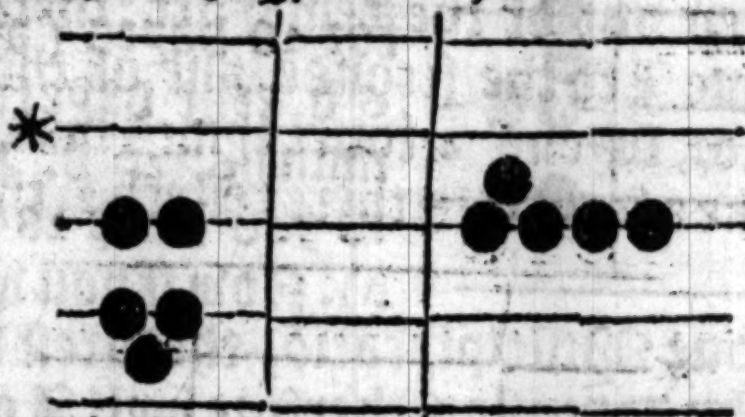
So is the hole wages of 40 workmen, for 28 dayes (after 6 d. eche daye for a man) 6720 d. that is 560 s. or 28 li.

M. Now if you wold

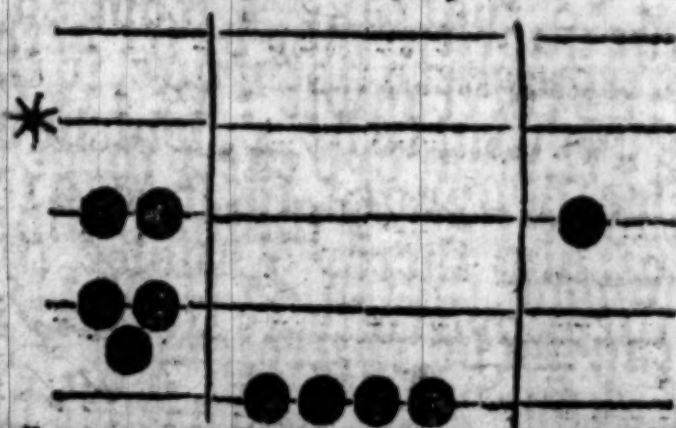
proue Multiplcation, the surest way is by Diuision:therfore wyl I ouer passe it tyll I haue taught you p arte Diuision of Diuision, whiche you shall worke thus. fyrste sette downe the Diuisor for feare of forgettynge, and then set the nomber that shalbe deuided, at p ryghte syde, so farre from the diuisor, that the quotient may be set betwene them: as for example: If 225 shepe cost 45 li. what dyd every shepe cost? To knowe this, I shulde diuide the hole summe, that is 45 li. by 225, but that can not be, therfore must I fyrste reduce that 45 li. into a lesser denomination, as into shyllynges: then I multiply 45 by 20, and it is 900, that summe shall I diuide by the nōber of S.iii. shepe,



Accomptynge  
 shepe, whiche is 225, these two num-  
 bers therfoze I sette thus.

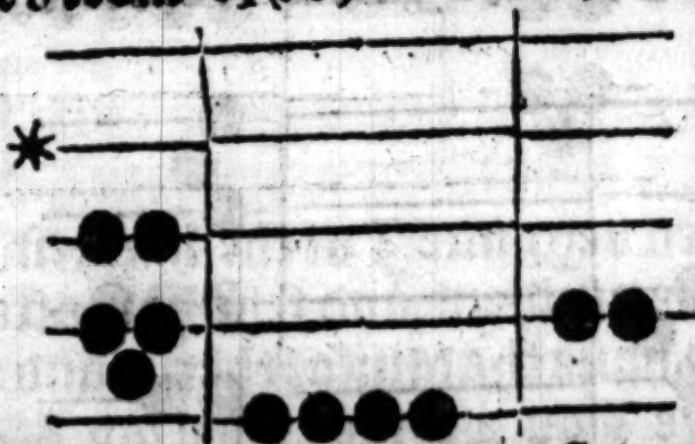


Then begynne I at the hyghest lyne  
 of the diuident, and seke how often I  
 may haue the diuisor therein, and that  
 maye I do 4 tymes, then say I, 4 ty-  
 mes 2 are 8, whiche yf I take from  
 9, there resteth but 1, thus.



And bycause I founde the diuisor 4  
 tymes in the diuidente, I haue set (as  
 you se) 4 in the myddle rounne, which

is the place of the quotient: but now must I take the reste of the diuisor as often out of the remayner: therfore come I to the seconde lyne of the diuisor, sayeng 2 foure tymes make 8, take 8 from 10, & there resteth 2, thus.

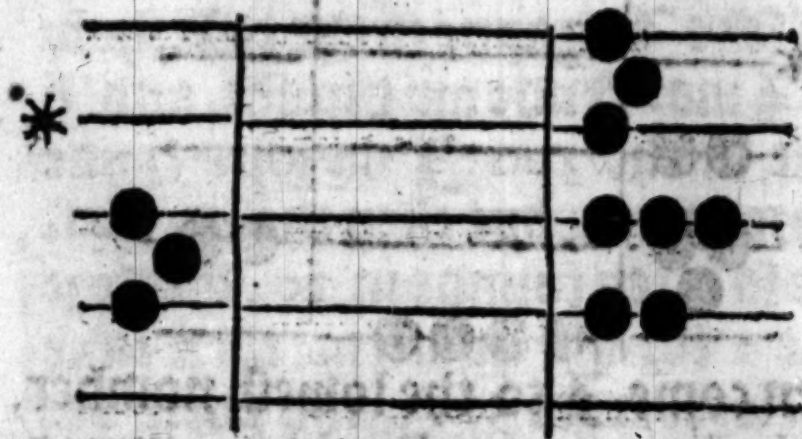


Then come I to the lowest number, whiche is 5, and multiply it 4 tymes, so is it 20, that take I from 20, and there remayneth nothyng, so that I se my quotient to be 4, whiche are in valewe myllynges, for so was the diuisident: and therby I knowe, that yf 225 shepe dyd coste 45 li. euery shepe coste 4 s. 5. This can I do, as you shall perceauue by this exāple: If 160 sowldyars do spende euery moneth 68 li. what spendeth eche man? fyrst

S.iiii.

by=

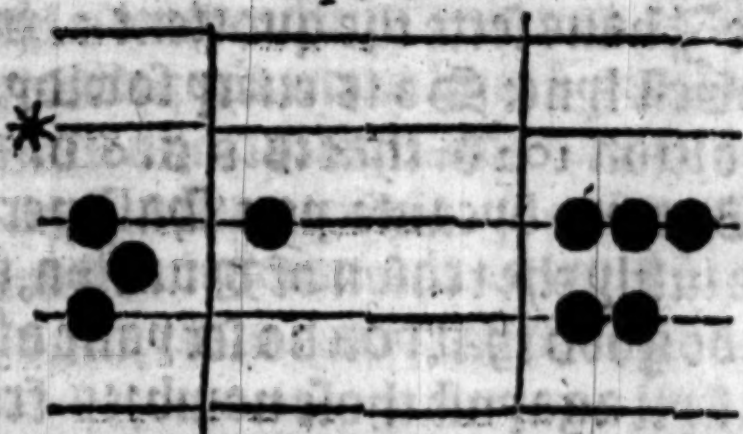
Accomprynge  
 bycause I can not diuide the 68 by  
 160, therfore I wyl turne the poudes  
 into pennies by multiplicatiō, so shall  
 there be 16320 d. Nowe muste I di-  
 uide this sūme by the number of sowl  
 dyars, therfore I set the i order, thus,



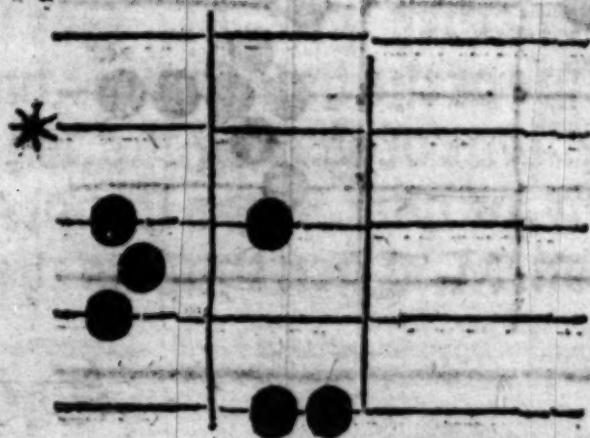
Then begyn I at the hyghest place  
 of the diuident, sekynge my diuisor  
 there, whiche I fynde ones, therfore  
 set I 1 in the nether lyne. M. Not in  
 the nether line of the hole summe, but  
 in the nether lyne of that worke, whi-  
 che is the thyrde lyne. S. So standeth  
 it with reason. M. Then thus do they  
 stande.

Then





Then seke I agayne in the reste, how often I may fynde my diuisor, and I se that in the 300 I myghte fynde 100 thre tymes, but then the 60 wyll not be so often founde in 20, therfore I take 2 for my quotient: then take I 100 twyse from 300, and there resteth 100, out of whiche with the 20 (that maketh 120) I may take 60 also twyse, and then standeth the numbers thus,



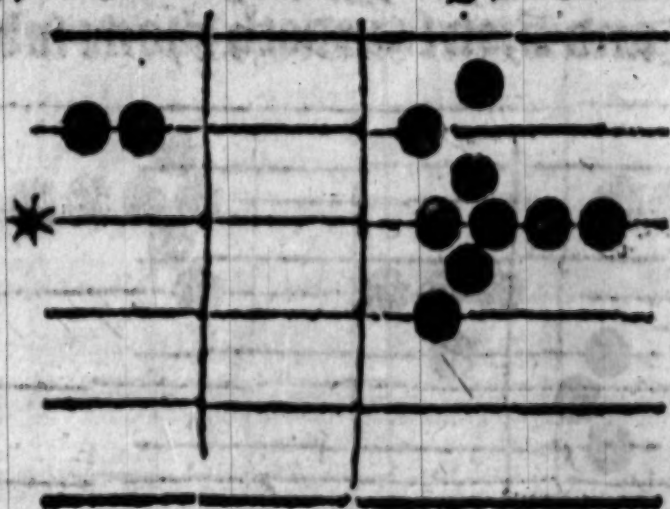
S. v.

where

## Accomptynge

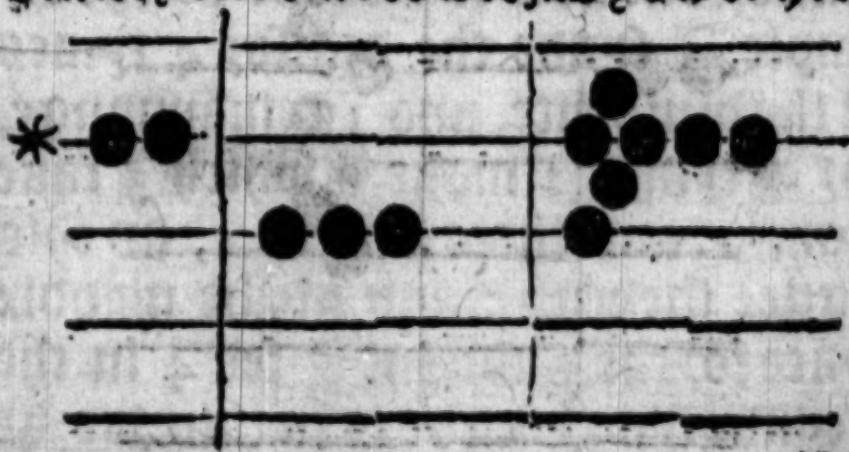
where I haue sette the quotient 2 in the lowest lyne: So is euery sowldyars portion 102 d. that is .s. 5. 6 d.

M. But yet bycause you shall perceave iustly the reason of Diuision, it shall be good that you do set your diuisor styll agaynst those nombres fro whiche you do take it: as by this example I wyl declare. If y purchase of 200 acres of ground dyd coste 290 li. what dyd one acre coste: fyrst wyl I turne the poundes into pennes, so wyl there be 69600 d. Then in settinge downe these numbers I shall do thus. fyrst set the diuident on the ryghte hande as it oughte, and then



the

the diuifor on the lefte hande agaynst  
thofe numbers, fro which I entende  
to take hym fyrft as hete you fe, wher  
I haue fet the diuifor two lynes hy-  
gher the is theyr owne place. S. This  
is lyke the order of diuifion by the  
penne. M. Truth you fay, and nowe  
muft I fet þ quotient of this worke  
in the thyrde lyne, for that is the lyne  
of vnities in respecte to the diuifor in  
this worke. Then I feke howe often  
the diuifor maye be founde in the di-  
uident, & that I fynde 3 tymes, then  
fet I 3 in the thyrde lyne for the quo-  
tient, and take awaye that 60000 fro  
the diuident, and farther I do fet the  
diuifor one line lower, as you fe here.



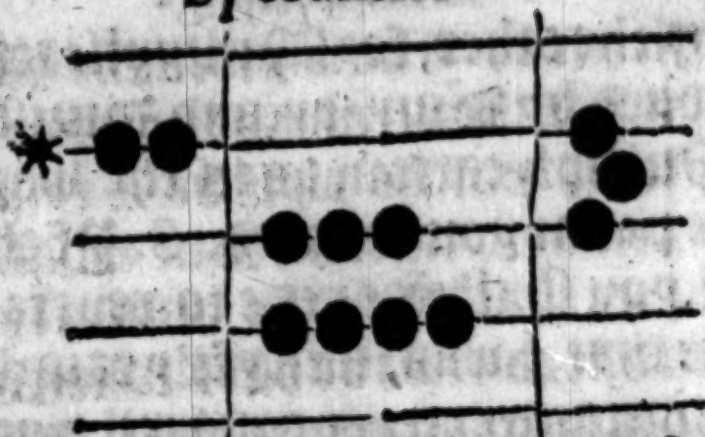
And



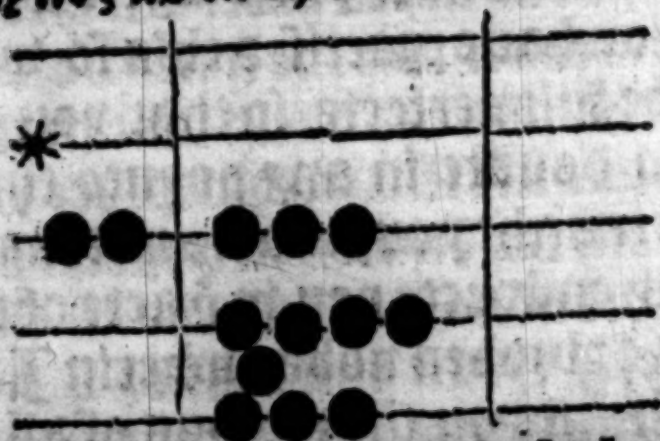
### Accomprynge

And then seke I how often the diuisor will be taken from the number agaynste it, whiche will be 4 tymes and 1 remaynyng. S. But what yf it chaunce that when the diuisor is so remoued, it can not be ones taken out of the diuident agaynste it? M. Then must the diuisor be set in an other line lower. S. So was it in diuision by the penne, and therfore was there a cypher set in the quotient: but howe shall that be noted here? M. Here nedeth no token, for the lynes do represente the places: onely loke that you set your quotient in that place which standeth for vnities in respecte of the diuisor: but now to returne to the example, I fynde the diuisor 4 tymes in the diuidente, and 1 remaynyng, for 4 tymes 2 make 8, which I take from 9, and there resteth 1, as this figure sheweth: and in the myddle space for the quotient I set 4 in the seconde lyne, whiche is in this worke the place of vnities.

Then



Then remoue  $\text{I}$   $\text{p}$  diuisor to the next lower line, and seke how often  $\text{I}$  may haue it in the dyuident, which  $\text{I}$  may do here 8 tymes iust, and nothyng remayne, as in this fourme,



where you may se, that the hole quotient is 348  $\text{d}$ . that is 29  $\text{s}$ . whereby  $\text{I}$  knowe that so moche coste the purchase of one aker.  $\text{S}$ . Now resteth the p $\text{r}$ ofes of Multipl $\text{y}$ catt $\text{o}$ , and also of Diuisi $\text{o}$ .  $\text{M}$ . Ther best p $\text{r}$ ofes are eche one

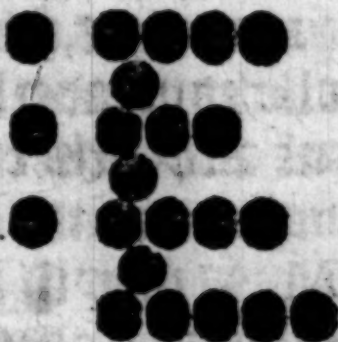
## Accomptynge

one by the other; for Multiplication  
is proued by Diuision, and Diuision  
by Multiplication, as in the worke  
by the penne you learned. S. Yf that  
be all, you shall not nede to repete a-  
gayne that, y<sup>e</sup> was sufficyetly taughte  
all redye: and excepte you wyl teache  
me any other feate, here maye you  
make an ende of this arte I suppose.  
M. So wyl I do as touchynge hole  
number, and as for broken number, I  
wyl not trouble your wytte with it,  
tyll you haue practised this so well, y<sup>e</sup>  
you be full perfecte, so that you nede  
not to doubt in any poynte that I  
haue taught you, and thenne maye I  
boldly enstruste you in y<sup>e</sup> arte of frac-  
tions or broken nōber, wherein I wyl  
also shewe you the reasons of all that  
you haue nowe learned. But yet be-  
fore I make an ende, I wyl shewe  
you the ordet of cōmen castyng, wher  
in are bothe pennes, shyllynge, and  
poundes, procedynge by no groun-  
ded reason, but onely by a receaued  
fourme



fourme, and that dyuerfly of dyuers  
men: for marchaūtes vse one fourme,  
and auditors an other: But fyyste for  
marchaūtes fourme marke this ex-  
ample here, in which

I haue expressed this  
summe 168 li. 19 s. 11  
d. So that you maye  
se that the lowest lyne  
serueth for pēnes, the  
nexte aboue for shyl-

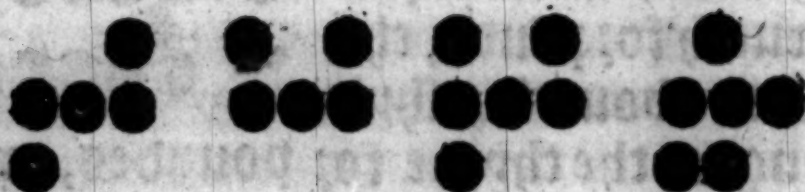


lynges, the thyrde for poundes, and  
the fourth for scores of pouīdes. And  
farther you maye se, that the space  
betwene penne and shyllinges may  
receaue but one counter (as all other  
spaces lyke wayes do) and that one  
standeth in that place for 6 d. Lyke  
wayes betwene the shyllinges & the  
pouīdes, one couīter standeth for 10 s.  
And betwene the poundes and 20 li.  
one counter standeth for 10 pouīdes.  
But besyde those you maye see at the  
left syde of shyllinges, that one coun-  
ter standeth alone, & betokeneth 5 s.

So

## Accomptynge

So agaynste the poundes, that one  
coūter standeth foꝛ 5 li. And agaynst  
the 20 poundes, the one counter stan-  
deth foꝛ 5 scoꝛe poūdes, that is 100 li.  
so that euery syde counter is 5 tymes  
so moch as one of them agaynst whi-  
che he standeth. Now foꝛ the accompt  
of auditoꝛs take this example.



where I haue expꝛessed þ̄ same sūme  
198 li. 19 s. 11 d. But here you se the  
pēnes stande toward þ̄ ryght hande,  
and the other encreasynge oꝛderly to-  
warde the lefte hande. Algayne you  
maye se, that auditours wyl make 2  
lynnes (yea and moꝛe) foꝛ pennies, q̄yl-  
lyngeſ, & all other valewes, yf theyꝝ  
summes extende therto. Also you se,  
that they set one counter at the ryght  
ende of eche rowe, whiche so set there  
standeth foꝛ 5 of that rouine: and on  
the



the leftē corner of the rowe it stādeth  
 for 10, of þ same row. But now yf you  
 wold adde other subtracte after any  
 of bothe those sortes, yf you marke þ  
 order of þ other feate which I taught  
 you, you may easely do the same here  
 without moch teachynge: for in Addi  
 tiō you must fyrst set downe one sūme  
 and to the same set the other orderly,  
 and lyke maner yf you haue many:  
 but in Subtraction you muste sette  
 downe fyrste the greatest summe, and  
 from it must you abate that other eue  
 ry denominatiō from his dewe place.  
 S. I do not doubte but with a lytell  
 practyse I shall attayne these bothe:  
 but how shall I multiply and diuide  
 after these fourmes? M. You can not  
 duely do none of both by these sortes,  
 therfore in suche case, you must resort  
 to your other artes. S. Syr, yet I se  
 not by these sortes how to expresse hū  
 dreddes, yf they excede one hundred,  
 nother yet thousandes. M. They that  
 vse such accomptes that it excede 200



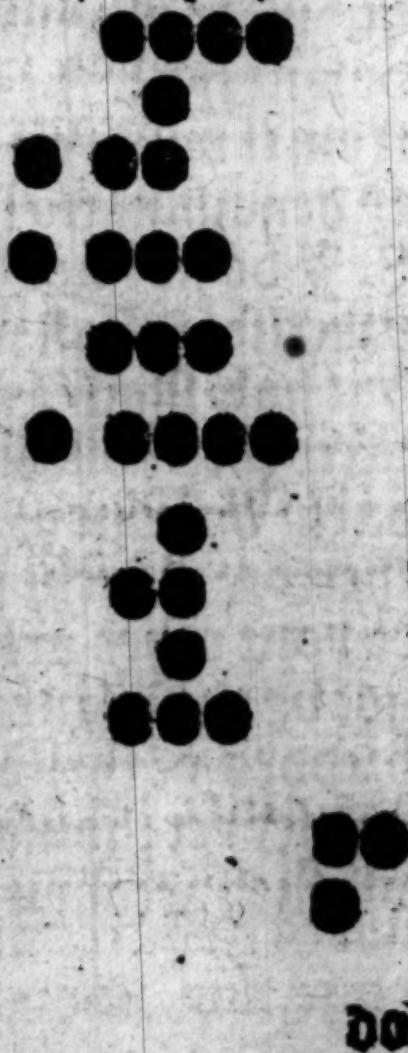
## Accomptynge

in one summe, they sette no 5 at the  
 lefte hande of the scores of poundes,  
 but they set all the hundzedes in an  
 other farther rowe, & 500 at the lefte  
 hand therof, and the thousandes they  
 set in a farther rowe yet, & at the lefte  
 syde therof they sette the 5000, and in  
 the space ouer they set the 10000, and  
 in a hygher rowe 20000, whiche all I  
 haue expressed in this example,

whiche is 97869 li

12 s. 9 d. ob. q. for

I had not told you  
 befoze where, no=  
 ther how you shuld  
 set downe farthyn=  
 ges, which (as you  
 se here) must be set  
 in a voyde space sy=  
 delynge beneth the  
 penne: for q one  
 counter: for ob. 2  
 counters: for ob. q.  
 3 counters: & more  
 there can not be,  
 for 4 farthynge



do

by counters.

133

do make 10. which must be set in his  
dewe place. And yf you desyre y same  
summe after audytozs maner, lo here  
it is.



But in this thyng, you shal take this  
for suffycient, and the reste you shal  
obserue as you maye se by the wor-  
kyng of eche sorte: for the dyuers wit-  
tes of men haue inuented dyuers and  
sundry wayes almost vnnumerable.  
But one feate I shal teache you, wht  
che not only for the straungenes and  
secretnes is moche pleasaunt, but al-  
so for the good comoditie of it ryghte  
worthy to be well marked. This feate  
hath ben vlsed aboue 2000 yeaeres at  
the leaste, and yet was it neuer comē-  
ly knowen, especyally in Englyshe it  
was neuer taughte yet. This is the  
arte of nombryng on the hand, with  
diuers gestures of the fyngers, expres-  
syng any summe conceaued in the

¶.ii.

mynde

The arte of nōbrynge  
mynde. And fyrst to begynne, yf you  
wyl expresse any summe vnder 100,  
you shall expresse it with your  
lefte hande: and from 100 vnto  
10000, you shall expresse it  
with your ryght hande,  
as here orderly by this  
table folowynge  
you may per=  
ceauē.

**H**ere foloweth the table  
of the arte of the  
hande.



			
1	10	100	1000
			
2	20	200	2000
			
3	30	300	3000
			
4	40	400	4000
			
5	50	500	5000
			
6	60	600	6000
			
7	70	700	7000
			
8	80	800	8000
			
9	90	900	9000

The arte of nōbrynge  
mynde. And fyrst to begynne, yf you  
wyl expresse any summe vnder 100,  
you shall expresse it with your  
lefte hande: and from 100 vnto  
10000, you shall expresse it  
with your ryght hande,  
as here orderly by this  
table folowynge  
you may per-  
ceau.

**T**here foloweth the table  
of the arte of the  
hande.

			
1	10	100	1000
			
2	20	200	2000
			
3	30	300	3000
			
4	40	400	4000
			
5	50	500	5000
			
6	60	600	6000
			
7	70	700	7000
			
8	80	800	8000
			
9	90	900	9000



The arte of nobrynge

- 1 In which as you may se 1 is exprefsed by þe lyttell fynger of þe lefte hande closely and harde crooked.
- 2 2 is declared by lyke bowynge of the weddyng fynger (whiche is the nexte to the lyttell fynger) together with the lyttell fynger.
- 3 3 is signified by the myddle fynger bowed in lyke maner, with those other two.
- 4 4 is declared by the bowyng of the myddle fynger and the ryng fynger, or weddyng fynger, with the other all stretched forth.
- 5 5 is representeth by the myddle fynger onely bowed.
- 6 And 6 by the weddyng fynger onely crooked: and this you may marke in these a certayne order. But now 7, 8, and 9, are exprefsed w<sup>th</sup> the bowynge of the same fyngers as are 1, 2, and 3, but after an other fourme.
- 7 For 7 is declared by the bowynge of the lyttell fynger, as is 1, save that for 1 the fynger is clasped in, harde & round

by the hande.

135

rounde, but for to expresse 7, you shall bowe the myddle ioynte of the lyttell fynger only, and holde the other ioyntes streyght. S. If you wyll geue me leue to expresse it after my rude maner, thus I vnderstand your meanyng: that 1 is expressed by crookynge in the lyttell fynger lyke the head of a bysshoppes bagle: and 7 is declared by the same fynger bowed lyke a gybbet. M. So I perceaue, you vnderstande it.

Then to expresse 8, you shall bowe 8 after the same maner bothe the lyttell fynger and the ryng finger.

And yf you bowe lyke wayes with 9 them the myddle fynger, then doth it betoken 9.

Now to expresse 10, you shall bowe 10 your fore fynger rounde, and set the ende of it on the hyghest ioynte of the thombe.

And for to expresse 20, you must set 20 your fyngers streyght, and the ende of your thombe to the partitiō of the

C.iiii. fore



The arte of nōb rynge  
fozemoſte and myddle fpynger.

- 30 30 is repreſented by the ioynyng  
together of þ headdes of the fozemoſt  
fpynger and the thombe.
- 40 40 is declared by ſettyng of the  
thombe croſſewayes on the fozemoſt  
fpynger.
- 50 50 is ſygnified by ryght ſtretchyng  
fozth of the fpyngers ioyntly, and ap=  
plyenge of the thombes ende to the  
partition of the myddle fpynger & the  
rynge fpynger, oꝝ weddyng fpynger.
- 60 60 is formed by bendyng of the  
thombe croked and croſſyng it with  
the foz fpynger.
- 70 70 is expzeſſed by the bowyng of  
the fozemoſt fpynger, and ſettyng the  
ende of the thombe betwene the 2 foz e=  
moſt oꝝ hygheſt ioyntes of it.
- 80 80 is expzeſſed by ſettyng of the  
fozemoſte fpynger croſſewayes on the  
thombe, ſo that 80 dyffereth thus frō  
40, that foz 80 the fozefpynger is ſet  
croſſe on the thombe, and foz 40 the  
thombe is ſet croſſe ouer þ fozefpynger.
- 90 is



90 is signified, by bendynge the 90  
foze synger, and setting the ende of it  
in the innermost ioynte of þe thombe,  
that is euen at the foote of it. And  
thus are all the nōbers ended vnder  
100. S. In dede these be all the nom-  
bers frō 1 to 10, & then all the tenthes  
within 100, but this teacyed me not  
howe to expresse 11, 12, 13, &c. 21, 22, 23 11, 12, 13,  
&c. and suche lyke. M. You can lytell 21, 22, 23  
vnderstande, yf you can not do that  
without teachynge: what is 11: is it  
not 10 and 1: then expresse 10 as you  
were taught, and 1 also, and that is  
11: and for 12 expresse 10 and 2: for  
23 set 20 and 3: and so for 68 you  
muste make 60 and there to 8: and  
so of all other sortes.

But now yf you wolde repesente  
100 other any number aboue it, you  
muste do that with the ryghte hande,  
after this maner.

You must expresse 100 in the ryght 100  
hand, with the lytell synger so bowed  
as you dyd expresse 1 in the left hand.

¶.v.

The arte of nōbryge

200 And as you expressed 2 in the lefte hande, the same fasthyon in the ryght hande doth declare 200.

300 The fourme of 3 in the ryght hand standeth for 300.

400 The fourme of 4, for 400.

500 Lykewayes the fourme of 5, for 500.

600 The fourme of 6, for 600. And to be Morte: loke how you dyd expresse single vnities and tenthes in the lefte hande, so must you expresse vnities & tenthes of hundredes, in the ryghte hande. S. I vnderstande you thus: 900 that yf I wold represent 900, I must so fourme the fyngers of my ryghte hande, as I shuld do in my left hand, to expresse 9, And as in my lefte hand, I expressed 10, so in my ryght hande must I expresse 1000.

1000 And so the fourme of euery tenthe 4000 in the lefte hande serueth to expresse lyke nōber of thousādes, so y fourme of 40 standeth for 4000.

8000 The fourme of 80 for 8000.

And



And the fourme of 90 (whiche is 9000 the greatest) for 9000, and aboue that I can not expresse any number. M. No not with one fynger: how be it, w<sup>th</sup> dyuers fyngers you maye expresse 9999, and all at one tyme, and that lacketh but 1 of 10000. So that vnder 10000 you may by your fyngers expresse any summe. And this shall suffice for Numeration on the fyngers. And as for Addition, Subtraction, Multiplikatiō, and Diuision (which yet were neuer taught by any man as farre as I do knowe) I wyll enstruct you after the treatyse of fractions.

And now for this tyme fare well, and loke that you cease not to practyse that you haue lear-

ned. S. Syr, with moste

harty mynde I thanke

you, bothe for your

good learning, &

also your good

cōsel, which

(god wyllng) I truste to folow.

Finis.



**N**o hede so hedely can be geuen;  
 But errour flypperly wyll crepe in.  
 For man wout errour scarsely can be,  
 So þe errour exceedeth all dyligence.  
 Paciently therfore I praye you here,  
 Those fewe fautes comytted here.  
 More pleasaunt ppyt I geue by reding  
 The greuous grefe by errours offen  
 (dying.

**Leffe, syde, lyne, Cozrection.**

2	2	14,	the more to be desyred.
5	1	4	I doubt not but this.
5	2	22	I wolde neuer blyne.
7	1	6	to cōtēde for the nōber.
7	2	15	plac, wherein they be set
8	1	19	that place is laste, þe.
28	2	18	wyte beneth þe nether=
			moste.
32	1		mende bothe examples
			in theyr seconde summe
			thus, 6, 7, 3,
33	1	18	of þe myllinges, which.
35	1	14	I rebate, and there re=
			steth 9; which I re.
41	1	16	I wyll propounde.
46	1	19	9400.





**C**Imprynted at London  
in Dowls church yarde  
at the sygne of the  
Brazen serpent  
by R. Wolfe.  
In the yeare of our Lord Christ  
M. D. xliii.  
in October.



*Francis B.*



Sum Barnardj hampton,  
einsg annicorj

L

2

3

4